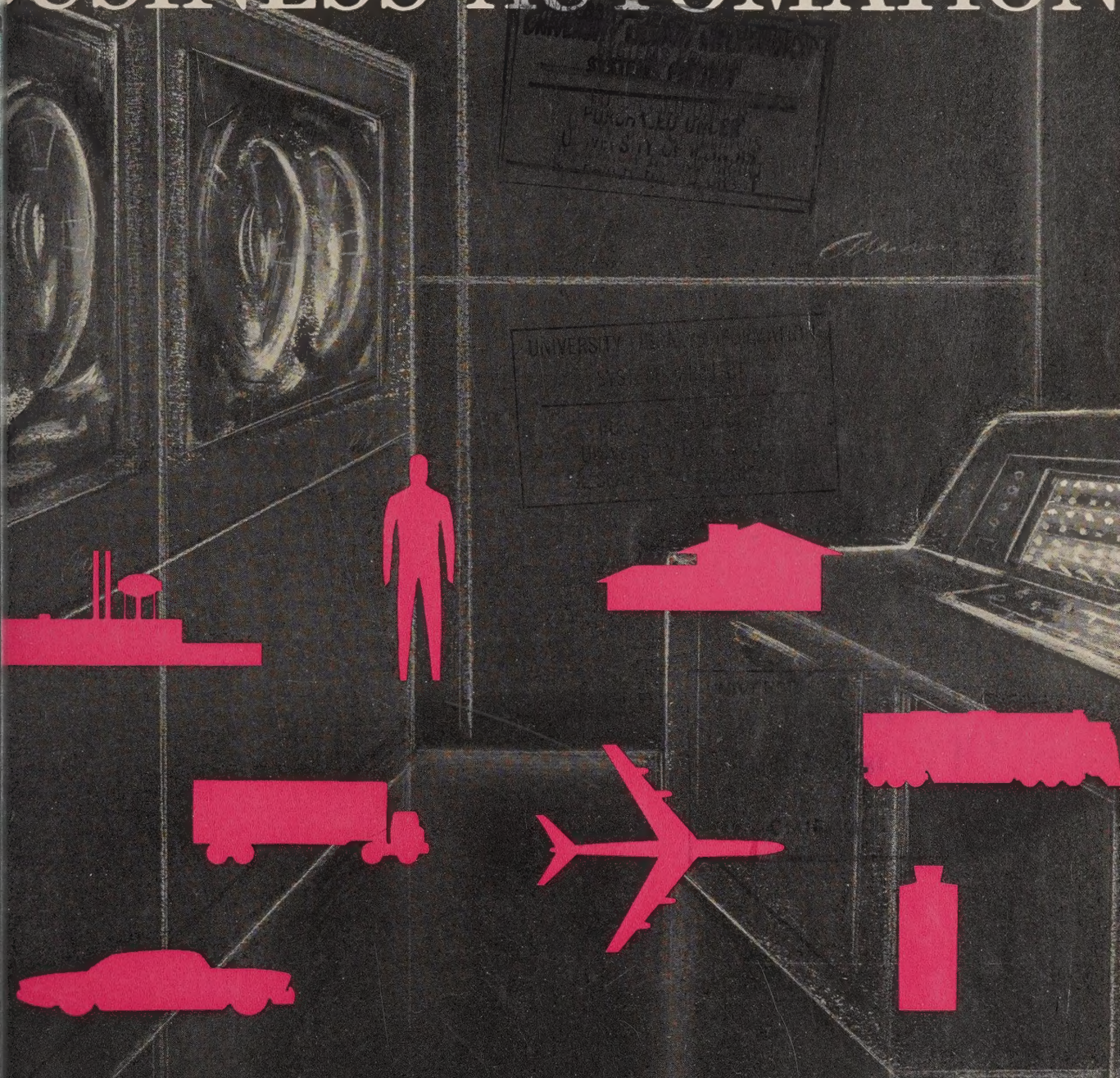


1961

Management
and

BUSINESS AUTOMATION



Forecasting Business Tomorrows

Page 14

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CONTROL AT

TEXAS INSTRUMENTS



John R. Brougher, Jr., Manager of Data Processing and Computation Department of Texas Instruments Incorporated

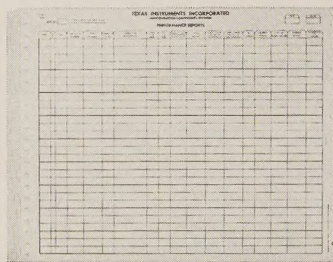
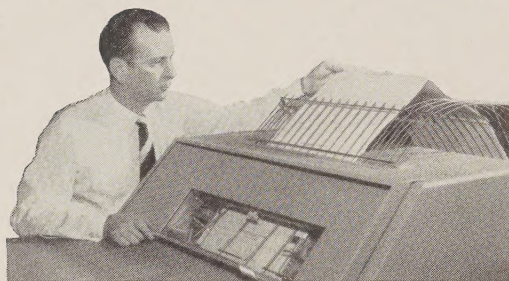
"We control component production on Speediflex"

THE SETTING: Production and quality assurance in the Semiconductor-Components division of Texas Instruments Incorporated requires collecting and analyzing a mountain of facts. TI's components include transistors, diodes, rectifiers, resistors, capacitors... the highly intricate units used in missiles and space vehicles. Checking production, production rates, and quality calls for processing, verifying, and printing facts in various report forms.

THE SYSTEM: Tab card job tickets are used to accumulate cost and production data at each work station. Pre-punched with constant information, the cards collect production data at each work stage and are sent to the Central Data Processing Center for computer processing. Fourteen product departments, with many individual production lines, 3 shifts, and more than 5000 part and operation numbers, are placed on magnetic tape for processing. The

computer calculates operation performance, various changes and rates, percentage yield, etc. In the area of quality control, automatic testing machines create a punched test record card for each component. These cards are then used in computer processing for statistical analysis purposes. A 7-part Moore Speediflex form is used to detail production data on the Weekly Line Summary. This is TI's control in print.

THE FORM: "Timely production of reports on our high-speed printer requires uninterrupted runs. The flexible bonding action of Moore Speediflex is excellent for a printer that won't take stapled forms," remarked Manager John Brougher of Data Processing and Computation. If you have a forms construction problem or need help in revising your processing system, look up the Moore man in the telephone directory or write the nearest Moore office.



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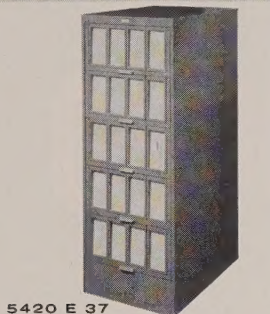
310 WSR
Wall Storage Rack



5422 E 73
Horizontal Tab Card File



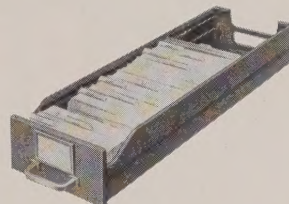
325 TH Horizontal
Card Tray Truck



5420 E 37
Vertical Tab Card File



350 WR Wiring Rack



5422 E 73
Tabulating Card Tray



348 C
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For More Information Circle Reader Service Card No. 153



Management and BUSINESS AUTOMATION

May, 1961

Vol. 5, No. 5

New ideas, developments, applications, results, and the human impact of business automation in commerce, industry and government.

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Scanning the Issue

IF YOU expand your sales force by 50 percent, how will that influence your product output requirements? How will it affect them five years from now? More and more companies are "Forecasting Business Tomorrows" with their electronic computers. Numerous organizations in every line of business, large or small, are taking the guesswork out of management decisions by utilizing models and simulation techniques similar to those described in this month's thought-provoking article by Win Dalleck.

Page 14

Order-writing and invoicing problems put The Plastex Co., Columbus, Ohio, 30 days behind schedule until management decided to incorporate "Automation on \$500 a Month." Now, on a small monthly budget, Plastex coordinates the activities of 10 warehouses and an export office-warehouse—all on an up-to-the-minute basis—through the use of an electronic computer. With it, Plastex has eliminated countless bookkeeping and inventory errors, improved customer relations, strengthened employee relations and saved considerable expense.

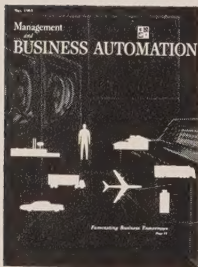
Page 20

Secretaries don't come a dime a dozen. And in some areas, they're pretty hard to get at all. That's a situation overcome by Combustion Engineering, Inc., where a handful of well-trained typists now handles correspondence for the entire executive staff. The company's technique in arriving at this unique solution to a very difficult office problem is reported in "Central Secretarial Pool Solves Company Labor Problem."

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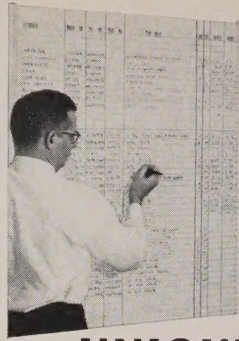
Benton & Bowles, Inc., a prominent national advertising agency, has scaled a paperwork mountain and reduced it to punched card simplicity. Reports that once took months to prepare now are accomplished in days; those that never could be handled before now are accepted as commonplace. By reading "Ad Game Played on Punched Cards," you'll learn why—and how.

Page 28



This month's cover

Trucking firms, airlines, manufacturing companies, department stores and other types of business will be equally interested in the decision-making, profit-producing possibilities of computerized models and modern simulation techniques, illustrated on our front cover.



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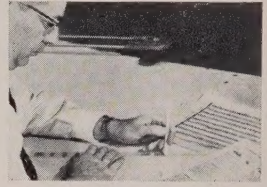
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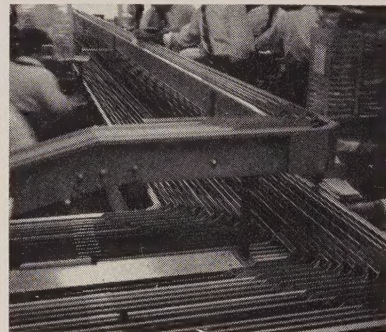
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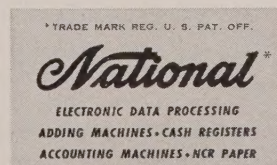
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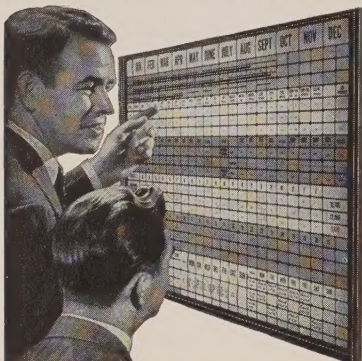
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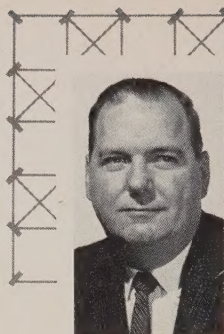
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RANDOM ACCESS

*Information bits from
the Editor's memory file*

A Volume of Data

One of the most important books in the airline industry, the 420-page International Air Transport Assn. Mileage Manual, has been written entirely by an IBM 704 computer. It will be used for computation of fares between 70,000 pairs of points on the world air network. It represents the culmination of almost three years of preparatory work by a special IATA Computer Working Group and is the first substantial step toward the possible eventual computation of all fares and rates by electronic means.

The manual gives airlines the shortest operated distances between selected pairs of 1,600 cities on the world airline map. Non-stop sectors flown by individual airlines were fed into the computer on magnetic tape. The machine calculated the various combinations possible, selected the shortest routing applicable between each pair of points concerned, chose four intermediate points to indicate the routing and printed the result on lithographic master pages. The work was carried out on IATA's behalf by Arthur D. Little, Inc., Cambridge, Mass., under the direction of Dr. Arthur A. Brown. Describing the complexity of the job, Dr. Brown points out that the number of all reasonably possible routings between the 1,600 cities concerned "is so large that you couldn't write it down within the solar system." Preparation of the manual involved over 800 million mileage calculations. While 36 months were needed to organize the project and prepare the data for the computer, final computation and production of the 420 master pages took only 30 hours. To calculate all reasonable routings from any one city in the tables to all the rest, and select the shortest operated mileages, takes just 12 seconds.

Help Wanted

The National Machine Accountants Assn. is seeking to employ a Director of Education.

The job requirements involve educational planning with member chapters and universities, and the preparation of educational materials and services. Some travel would be required.

Applicants must be college graduates, under 40 years of age and have background in education plus practical experience in EDP. Resume and photograph should be forwarded to NMAA, International Administrative Headquarters, Attn: R. Calvin Elliott, Executive Director, 1750 W. Central Rd., Mt. Prospect, Ill.

Keep an Eye on the Bull

The Stockholm Svensk Husdjursskötsel, national Swedish cattle breeders association, has ordered an RCA 301 computer system for use in maintaining detailed breed-line records of dairy cattle throughout Sweden. The system will record milk and meat production of each animal on the SSH roster so that the most productive animals can be selected for breeding purposes.

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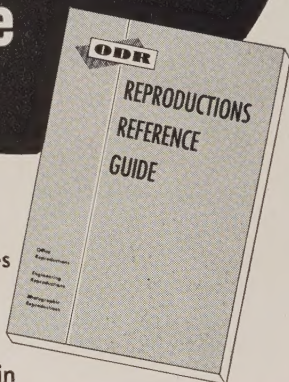
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NEXT MONTH, the editors will present the results of our third annual salary survey. The first study, in 1959, involved salaries in machine accounting or tab room jobs. Last year's report featured jobs in the area of computer operations. The survey now being completed once again covers all positions normally found in a tab room installation.

Actually, the current salary project has been under way for many months. Research of this type is a tremendous undertaking, not only in the number of people involved, but in cost and in time, also.

A very large statistical sample is used in order to determine pay scale differences among 20 of the nation's largest cities. By relating these new figures with those of the 1959 study, readers will have for the first time an indication of salary trends by area of the country, as well as by job titles.

Philip A. Weber & Associates, widely-known specialists in salary administration, once again have handled the myriad of details such a project entails. Final interpretation of the statistical results for presentation in the June issue is nearing completion under the direction of Arnold Keller.

Our special appreciation, however, is reserved for the thousands of readers and their associates who took the time to fill out the lengthy questionnaires necessary to obtain complete and accurate data. Salary details generally are of a very confidential nature and we are very pleased that so many companies saw fit to waive policy restrictions in order that we might present this important study to the entire industry.

Charles W. Gilbert

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Letters

Dear Sir:

The January installment of the round table discusses many noteworthy aspects of business automation . . . past, present and future.

One must disagree, however, with the sentiment, expressed on page 39, that business automation has not created job displacement. Mr. Simmons admits almost the entire 2,500 persons whose jobs were affected by the introduction of new equipment "were transferred to other positions, which otherwise would have been filled by new employees."

With the labor market having increased from approximately 56 million in 1940 to 72 million currently, vacancies and new jobs must be filled primarily from the new labor market.

Every precaution should be taken to avoid the disastrous consequences of recent mechanization and automation of the coal fields and farm belt.

Robert R. Robinson
Federal Housing Administration

Dear Sir:

As public relations chairman of the Washington, D. C., chapter of the Association For Computing Machinery—and as the writer of the press release that was apparently the source material for your January and February Random Access columns on election eve computer activities—I feel obliged to support Dr. Eugene E. Lindstrom's objections to your editorial comments.

None of the speakers on the ACM panel "conceded" or even mentioned programming errors. Nowhere in the release did I state or even imply that "inadequate programming" or any "error in programming" was responsible for the early projection of a Nixon victory on two of the networks. Any such statement would have been inaccurate reporting of the panelists' comments, and any such interpretation of the release is a misinterpretation. The difference between the networks, as correctly stated in the release and in Dr. Lindstrom's comments, was in the "mathematical model" approach vs. the "statistical" approach

—not in the quality of the respective programming efforts.

Zeke Seligsohn
Public Relations Chairman
Assn. for Computing Machinery

Editor's Note: As conceded in February's column, "programming" was not involved in the election prediction errors.

Dear Sir:

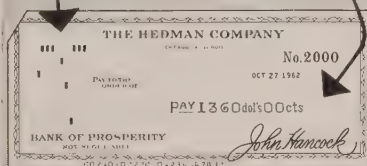
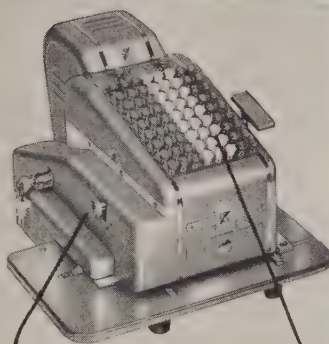
In your February issue, on page

38, there appeared a particularly fine cartoon. We would like your permission to reprint this cartoon, entitled "Button Pusher," in our monthly employee publication, Computer Chats.

Most of our key executives read your fine publication. This cartoon, however, is one which we would like to share with the rest of our employees.

Tom Horan
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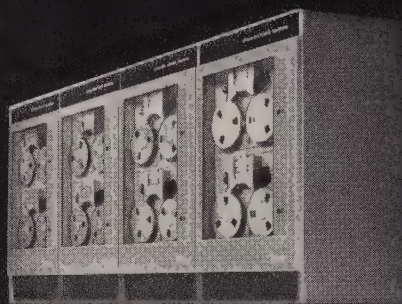
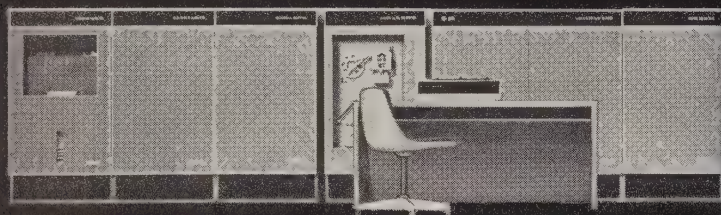
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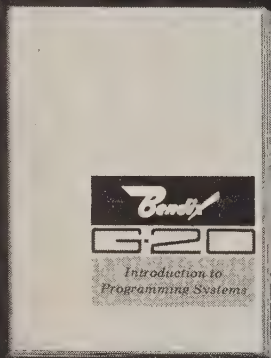
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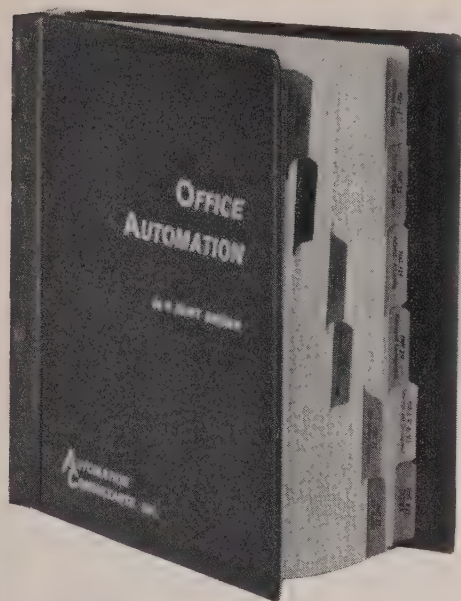


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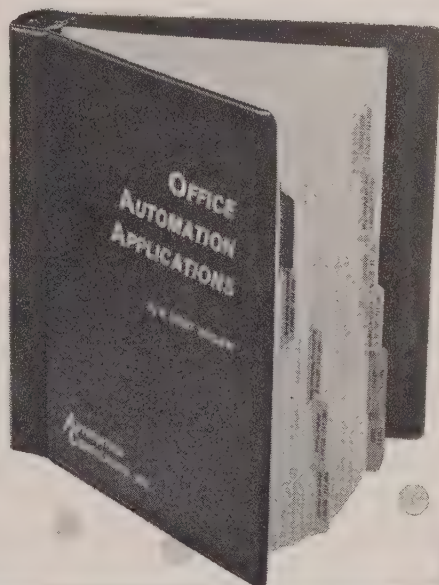
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Forecasting Business Tomorrows

Management has found that big computer "payouts" lie with the machine's ability to project the results of today's decisions.

By Winston C. Dalleck

AS BUSINESS MODELS and simulation techniques move up the management ladder, playing an increasingly important role in helping top executives to direct their companies, will the electronic computer someday take over at the head of the directors' table?

Of course not. But it is going to be more and more common to find men waiting for information from a computer before making major decisions.

Many examples of this trend already are in evidence.

In a major food processing company, the executives used a simulation model before making decisions on the configuration of a transport fleet to ship raw material to U. S. refineries. The model is a simulated representation of the company, including warehousing facilities, shipping fleet, mainland refineries and relevant cost and operating factors. By plugging in the latest crop production and capacity figures, the company can now determine which warehouses are at capacity, what refinery to ship its product to and, if necessary, redirect cargo ships from one refinery to another while in mid-ocean.

Before deciding on a series of major capital investments, another company is building a model of the probable cash flow from these investments. With this, the company can evaluate and choose the best possible combination of investments.

A diversified company whose products move through multiple channels of distribution is devising an optimal distribution and pricing system. To test out the possible effects of various alternatives, it is creating a computerized simulation version of its marketing system.

Ready for a militant union

A major shipper faces the problem of deciding what percentages of his transport fleet should be owned or leased, leasing being available on a short-term, medium-term or long-term charter. The situation is complicated by wide swings in demand and cost for transport. At a peak, the costs of short-term leases reach phenomenal heights, which forces users to take on less expensive long-term charters. But at the trough, when usage is down, a large fleet owner or long-term lessee can find himself paying costly overhead for unused transport. To determine the optimal ratio of owned to short, medium and long-term charters, the company is turning to a manipulatable and self-correcting model that weighs all key factors in search of optimal combinations.

One company, in getting ready for bargaining

sessions with a militant union, is considering a computerized model of its cost structure. As union bargainers make alternate demands, the company can test out their cost effect within minutes and be able to make optimal counter-offers.

A large oil company, facing strong competitive sales pressure in an industry that currently is over capacity and anxious to cut costs as well as to expand into new geographic markets, is considering construction of a linear programming model of its operations. The company expects such a model would show the effects on cost and profit of various alternatives. It wants to determine the lowest cost use of existing facilities to distribute products; to decide capacity levels at which given refineries should be run at different times; to find out if some refineries should be eliminated; and to show where to establish new ones. Using the model to simulate the refinery operation, the company will be able to make the most effective short and long-term decisions.

Interest from bellweathers

These examples show how simulation and model building (a part of the operations research approach), used in conjunction with computers, can help managements run their companies. While some operations research people make a sharp distinction between simulation models and purely mathematical models, it is appropriate for the general discussion in this article to consider both types as being useful in simulating business problems. Some of these examples are in actual operation today. Others are only in the idea stage. Many more advanced studies still are evolving, and over the long run, this kind of simulation likely will become the single most important use of electronic computers.

Computerized simulation and related techniques are moving into the front office for a combination of reasons. As they gain experience with these new tools, companies are getting a "feel" for their uses, gaining sophistication in applications. Bigger, faster computers are coming on the market just in time to provide the kind of capacity called for by these higher-level problems. Also, it is in these higher-level applications that these techniques exert greatest leverage on really important dollar figures.

Ten years ago, experts were saying that operations research and simulation techniques would never be applicable to complex and subjectively oriented activities such as marketing. Now a number of predictive simulation marketing models

are evolving in several companies, models which take into account possible competitive action and reaction in the market place. A number of companies are developing forecasting models of their businesses, and some initial attempts to evaluate and plan research programs via allocation models are under way.

You are not likely to hear much about what many companies are doing in this field. This is because most projects still are very much in the experimental stage and take a long time to come to fruition. Perhaps most important, though, is that companies feel any usable techniques and concepts they bring forth can give first users a competitive edge that would be foolish to discuss publicly.

We do know, however, that the bellweather companies in U. S. industry and their most ambitious rivals are becoming increasingly interested in simulation applications, and that within 10 years a number of major firms will be making key investment and marketing decisions using models of their markets and internal operations.

To a great many companies, this presents the threat of being outpaced by rivals using new techniques. This is not going to happen tomorrow. It may take a full generation of management to develop and apply really effective simulation techniques. But the effectiveness with which a company's next generation of managers adapts these techniques depends on how effectively current managers prepare their companies now. It is going to depend on top executives in companies knowing: What simulation and mathematical models are; where they best can be applied; what the main barriers to successful application are; and how to break down these barriers.

Mirror of reality

When a naval architect tests a model hull in a tow tank or when aircraft or automobile engineers test models in a wind tunnel, they are simulating. Changes are made in operating and structural characteristics — finish, controls, fuel settings, braking systems, for example—to make decisions about the nature of the end product. A chemist does the same thing when he is developing a new product or compound. Before committing his company for large-scale and costly operations, he runs batches of the product through laboratory and pilot studies, to test chemical reactions and production techniques. From these tests and their results, the best alternatives can be evaluated.

Decisions in business are very similar. The business executive is continually faced with problems

involving more than one decision choice. His query is: Which of the alternatives available to me is best? The choice is made by comparing several alternatives, using an appropriate criterion (usually profit, cost or service) for evaluation.

In this decision-making process, the management executive is simulating. He tries mentally or intuitively to visualize what will happen to quality of service, profit or costs under each of the decision alternatives.

This kind of testing and weighing of alternatives—a mental simulation process—is the essence of executive skill. As business operations become large and more complex, however, even the best management people find it difficult, often impossible, to cope with some of their problems.

It is here that formal simulation and the computer can aid top management. They use a model which essentially is a symbolic representation of a system or operation. The model may be a set of linear equations or series of statistical relationships. If mathematics is insufficient to describe a business operation, it may be augmented with diagrams, flow charts and descriptive word statements. The important thing is that the model can be manipulated to test changes made in it. And, it must be realistic.

The objective is to mirror reality sufficiently so that one can simulate actual conditions and experiment with desired or expected changes in these conditions. Observing the effect of changes makes comparisons possible. This leads to the identification of the best set of alternative conditions as the basis for a decision.

Simulation and model building, in effect, are a technique for bringing order and predictability out of a seeming chaos of multiple variables. A unique advantage is the ability to push ahead in time, allowing a company to pre-test possible alternatives under variable conditions representing future periods of weeks, months or even years. This glimpse into "possible futures," if the model is realistic, permits a company to evaluate and choose the most favorable of the many alternatives open to it.

These techniques lend themselves most readily to large, very complex problems involving subtle inter-relationships that are difficult to visualize and measure. They are most applicable where the cost and profit implications of a given move are large, and where the mass of information needed to make a decision can be quantified, put into numbers, or set within limits.

The vanishing barriers

This means that large organizations tend to offer more opportunity for simulation and model building applications, but there is another factor. Because of the size, complexity and management structure of large corporations, simulation techniques of this type tend to run up large bills, take a long time to apply and are difficult to sell. Small and medium-size companies, when they spot a likely opportunity, are often able to develop and apply it much more quickly and easily than the giants.

For a total cost of \$10,000 for outside assist-

A Production Planning Model

The Problem. A large nation-wide company with six plants producing over 100 products was faced with a problem of trying to balance inventories and reduce transportation and manufacturing costs. Attempting to do this, and still maintaining a high level of customer service in six market zones at once, had become too big and complex a task for the corporate executives to handle effectively using available methods and their management know-how.

Many of the same items were made in each plant in order to keep shipping costs down. Manufacturing costs varied widely from plant to plant. Shifting production to low-cost plants helped, but as demand changed, an imbalance of inventories occurred. The result: unplanned volumes of finished products had to be shipped across one or more zone boundaries, pushing shipping costs up. Each attempt at correction created a new set of problems—a frustration facing many large business organizations.

To help solve their problem, the management of this company resorted to the use of linear programming. The purpose of the model: to completely describe the pertinent

aspects of manufacturing and distribution activities to include all possible production decisions, and to prescribe to meet demand for any period—monthly, quarterly or annually, as desired—at the lowest total cost of manufacturing, transportation, inventories and back-ordering.

The model achieves its objective in a systematic and comprehensive way with the aid of a computer. It considers every production opportunity and sorts these until it finds the combination of individual item decisions which satisfy demand requirements at lowest cost. This is the optimal solution according to the linear programming model. (The word optimal means that there is no lower cost combination of production decisions available to meet demand for the conditions assumed. There may be some as good, none better.)

In providing this solution, the model also indicates management what it will cost to deviate from the optimal solution (e.g., shifting 100 units of product X from plant to plant II will add \$1.10 per unit to the total manufacturing cost).

ance and the rental of a computer, one large sales chain was able to save \$200,000 in a year's time through inventory reduction.

Most applications to date have been in repetitive or highly complex, but lower-level, operations. The use of operations research techniques got their business start in warehouses working on inventory, moved into plants via production scheduling and control systems, and gradually spread out from there. They now are moving steadily into more and more important long-term policy decisions. It is here that there is the greatest payout, but it is here that they also are running into their greatest stumbling blocks, partly because these areas are the most difficult to simulate and partly because of some major barriers.

One set of barriers is that simulation studies tend to be expensive and often take much time.

A large transportation company, after preliminary studies, decided to build a simulation model of its maintenance activities with an eye to improving schedule performance and operating costs. The study, which was set up to take two months at a budgeted cost of less than \$10,000, took two years and over \$100,000.

In the refinery and other process industries, projects frequently cost from \$100,000 to \$200,000, primarily because of the time-consuming efforts needed to gather data and construct complex models.

Optimistic study teams often tend to discount these time and cost factors. The payout for many programs, however, can be impressive. The transportation company mentioned previously achieved

a yearly saving of more than \$1 million in cost, and increased income from greater utilization of its equipment. And, thanks to an effective simulation model, one company expects to increase after-tax earnings 20 percent by using its production facilities more efficiently. So, as companies learn more, the time-and-cost-barrier tends to vanish.

The main barrier, however, is the lack of management understanding and acceptance of computer simulation tools. It is precisely because major decisions demand a high order of intuitive or mental simulation from managers that they unconsciously, or sometimes quite consciously, balk at these new techniques. Some managers view them as a threat.

Sugar-coated surveys

Also, computerized simulation and model building usually involve great amounts of abstruse mathematics. Most executives, who tend to be gunshy of anything but the most forthright and simple figures, boggle at this mathematics.

When operations research people try to explain their activities to line executives, they too hit a road block. It is almost impossible to explain mathematics to a layman without sliding into jargon or running out of language. As a result, O.R. men tend to oversimplify drastically. Often, executives feel and resent the fact that they are being talked down to. They look at the oversimplified example given them, study the simplest relationships and conclusions being drawn from seemingly insignificant minutiae, and come to one

Model. A mathematical program involving series of linear equations describing all production opportunities and demand requirements model. The solution is arrived at subject to objective that total costs of every product line in each plant will be minimized. This minimizing function or instruction simply tells computer to find the lowest total cost earned over all plants, products, market zones and time periods. The mathematical form of objective statement is:

$$\text{Min } \sum_{ijklt} c_{ijklt} x_{ijklt}$$

c = cost per unit
 x = production
 i = product
 j = plant
 k = market zone
 l = demand period
 t = period produced



The Computer. The linear program is taken in computer language form and, at high speed all production combinations are sorted by the computer to find the optimal combination.

The Results. (1) An optimal solution. (2) The total cost for this solution. (3) A list including every item decision. (4) The incremental cost of deviating from the optimal solution. (5) The incremental saving if a bottleneck capacity could be increased.

A Maintenance Station Model

The Problem. A large transportation company was faced with the problem of planning the operation of several big maintenance locations. It could be a bus, truck or airline company, having several large stations with equipment arriving at and leaving each station according to a pre-planned schedule.

The nature of the operation is such that each unit of equipment, upon arrival at each of these stations, will require some kind of maintenance, major or minor. The problem in operating each station is to provide sufficient facilities and manpower to complete all necessary maintenance work and to make units of equipment available to meet departure schedules. Two criteria govern decisions made: (1) meeting departure schedule requirements and (2) minimizing total operating costs.

A multitude of problems complicate the operation. Some of these are: (1) The early or late arrival of equipment makes work scheduling difficult. (2) Limited maintenance facilities (parking space, working areas, major parts) create bottlenecks and priority problems concerning which units should be worked on first, or if work on one unit should be interrupted to start on another. (Unlimited facilities to alleviate this, of course, would be too costly.) (3) Trying to meet turn-around assignments (i.e., the unit of equip-

ment arriving on trip 15 should be available to go out on trip 38) imposes a limitation on the time available to do maintenance work. (4) Work force will vary due to sick leave, training and the like, making manpower availability somewhat unpredictable. (5) The amount of maintenance work done on each unit of equipment may vary from plan. The work on some units may be finished early; others may take much longer; and some may even have to be taken out of service for a period. All of this unbalances equipment availability.

These and many other problems make the operation of a major maintenance station difficult. One large transportation company solved this problem by building a simulation model. The company was able to study fully how all the variables affect the operation. The management also used the model to look beyond the short-term operating problem; for example, they examine the effect of a major change in the schedule to determine how to meet these changes with extra work shifts, spare equipment, revisions to the turn-around plan and other activities. Some of the specific operating data that was developed: (1) Percent of trip departures on time. (2) Idle time of manpower shortages by hour of the day. (3) Number of planned turn-arounds met. (4) Equipment utilization.

conclusion: O.R. teams are working overtime to make the obvious seem difficult.

Most line executives also realize that a simulation model is only as good, or as realistic, as the assumptions built into it. They question the ability of an O.R. team to draw the right assumptions. There are plenty of cases where O.R. teams have missed the boat and this leads to a not-always-unhealthy skepticism on the part of management.

In large part, the problems that simulation and model-building proponents face in gaining acceptance must rest on their own heads. Few have done a good job of selling and explaining their techniques to management.

In the final analysis, however, the main responsibility rests with top management. Simulation is on the rise. It is top management's responsibility to see to it that their company moves with the leaders in this trend. The question is: How best to do this?

Here, based on experience of companies that are active and have been successful in this field, are some points that may be useful:

Companies reporting good acceptance and useful results from their applications tend to follow a simultaneous application and education program. Rather than vast overall studies, they concentrate on well-defined shorter-term projects that give fair assurance of an immediate and discernible payout. Meanwhile, they devote important amounts of time to getting this successful program understood and backed by management.

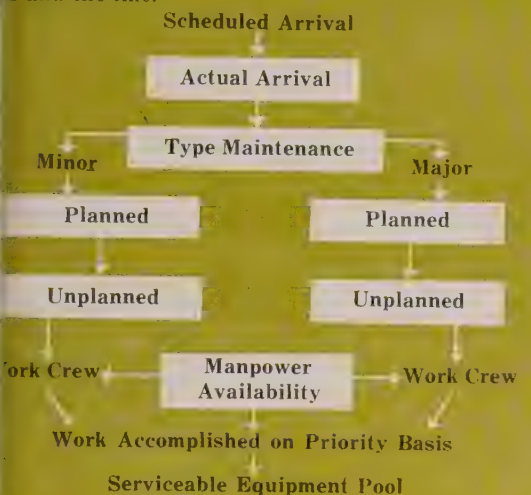
Some companies educate their top management, not through sugar-coated survey courses, but through fairly rigorous comprehensive in-plant training sessions conducted by company O.R. men and/or competent outside specialists.

Games for bankers

Telling the story of a simulation project to your people is necessary to implement results effectively. One large company, whose first attempt at simulation resulted in a very useful model, achieved this end by putting on a "road show." All personnel and departments concerned in any way with decisions stemming from the information provided by this model were given a complete review of the project. They were told clearly in a numerical and graphic manner how the model worked, what input data were required, what the output information looked like, what part the computer played, and how these results would be used. As a consequence, the company gained much in getting understanding, cooperation, and a real sense of participation from its people.

Computerized management games are sometimes a useful and fairly simple tool for introducing managers to the concepts and potential of simulation. McKinsey & Co., Inc., management consultants, and a group of West Coast banks developed a "Bank Management Game." The game was programmed for computers by IBM and since has been taken up and played in dozens of banks

The Model. A simulation of the station embracing equipment movement, work flow, assignments, priorities and the like.



Equipment Assignment For Scheduled Departures



The Computer. The station model for any set of prescribed conditions, schedules, manpower and the like is run on the computer, providing a complete picture of operations results.

The Results.

- On Time Departure Performance
- Turn-arounds Met
- Facility Utilization
- Manpower Idle
- Manpower Short
- Equipment Substitutions

around the country. The game is by no means an actual simulation of a real bank, but it is a rough and essentially simple facsimile of a banking operation. The game can give middle-level bank managers useful insights on the basic inter-actions within their business and between it and the economy. As such, it is a fairly useful management training device, but over the long run, its greatest value to bankers is likely to be the understanding and insight it can give all levels of management into the applicability and potential of simulation in a bank's loan and investment activity.

The same holds true for general management games throughout industry.

The grapevine spreadeth

Whatever training or other preparation a company undertakes, the objective is clear—to achieve successful application of simulation through understanding. During the development and testing of a computer model, only a limited few can become involved in the details. But the general nature of the work going on usually becomes known throughout the company via the "grapevine." Not being apprised of the full story—and because of implied overtones of automation and its effect on jobs and responsibility—many company personnel become curious, anxious, even resentful of the expected outcome of the project. Only by frank and complete discussion of the simulation work can understanding and participation be realized.

It is not necessary for a company to wait until it owns a computer and has qualified specialists on its staff to make sure of simulation and other operations research tools.

A large manufacturing firm in the east is a typical example of a company that went ahead without either the computer or an operations research staff. They had a serious production problem and, having read and heard indirectly about "linear programming," they called in some specialists to help. After a brief preliminary study, it became apparent that linear programming was quite feasible. The specialists, working with key company personnel, began developing a model and bought computer time from an outside service organization.

Meanwhile, the company began a search for operations research talent, with their outside specialists helping them in the screening process. It was important that the company do this. Long-term implementation of the production planning model would be achieved successfully and economically only if the company became self-sufficient in operations research skills and computer know-how. They now have a small, well-qualified staff, but they still do not have their own computer—and they do not need one. The rented computer still is doing the necessary work for their month-to-month production planning and will be adequate for some time.

While there is no concise and clear sequence of

Continued on Page 44

When business paperwork mounted to costly proportions the Plastex Co. invested in rental of a small computer system that not only did the work but realized big savings.

Automation on \$500 a Month

A SMALL COMPANY with only \$500 per month to invest in business automation has succeeded in reducing its overhead, increasing its working capital, eliminating numerous paperwork bottlenecks and creating additional short and long-term benefits through the use of an electronic computer.

Because of a computerized system, The Plastex Co., Columbus, Ohio, created a more profitable operation than it has enjoyed for some years.

Plastex serves approximately 2,000 customers in the automotive, aircraft, appliance and building trade fields. It manufactures about 2,000 finished items, including plastic sheeting, breaker strips, sign faces, lamp shields, decorator wall coverings and pipe. The company receives 100 orders a day, averaging 15 line items per order. Quantities of each item vary from one to many thousands of units, and each item is subject to one or more discounts, depending upon item group and quantity purchased.

In the past, although it had four to six people working 11 hours a day, six days a week, Plastex was unable to keep up with its invoicing. Backlog ran as high as 30 percent during the heavier months.

Employee fatigue led to error, and credit memos became as common as scratchpaper, compounding the company's problems with each additional order. Inventory control was perpetually out of date. Reports were late, customers were annoyed, and salesmen could not be sure of receiving their commission checks on time.

Calculating machines and register-type ma-

chines simply could not cope with this workload, and to increase the staff and buy additional office machines to meet the demand seemed impractical because of space, economy and a desire to avoid seasonal personnel fluctuations.

Richard Zimmerman, Plastex president, and John Schnorf, treasurer, investigated various possible solutions to the problem, one of which was to rent or buy a computer and to automate the company's entire order-invoice system.

Financially, they felt that the company could not budget more than \$500 per month for automation. Anything above that figure would have to come from positive, traceable savings, generated by the computer itself.

The old order changeth

A Royal Precision LGP-30 computer system would cost \$1,515 a month in rental fees, but convinced that the company could realize the additional \$1,000 per month in savings, Schnorf ordered the equipment and then enrolled in a two-week Royal McBee computer training course in Chicago.

Following this training, Schnorf began to prepare the necessary programs with which to change his old order-invoice procedures to a computerized operation. The change was accomplished so economically that it was possible to utilize two girls from the regular office staff as his equipment operators.

Schnorf's new system centers around two edge-punched cards, the Customer Control Card and the



John Schnorf, treasurer of the Plastex Co. is shown helping an operator introduce a new program via an on-line Tape-Typewriter to the Royal Precision LGP-30 computer system.

Item Card. The Customer Control Card contains all pertinent customer information, such as name, address and shipping instructions. The Item Card carries all the data on a given item, including the stock number, proper description, gross price and discount group. These cards are stored in a portable file cabinet alongside the off-line, order-writing tape-typewriter.

When an order is received, it goes to the operator of the off-the-line order writer, who pulls the Customer Control Card from the file and places it in the tape-typewriter's edge-punched card reader. A 13-page set of order-invoice forms is positioned in the typewriter and a paper tape is inserted in the typewriter's tape punch.

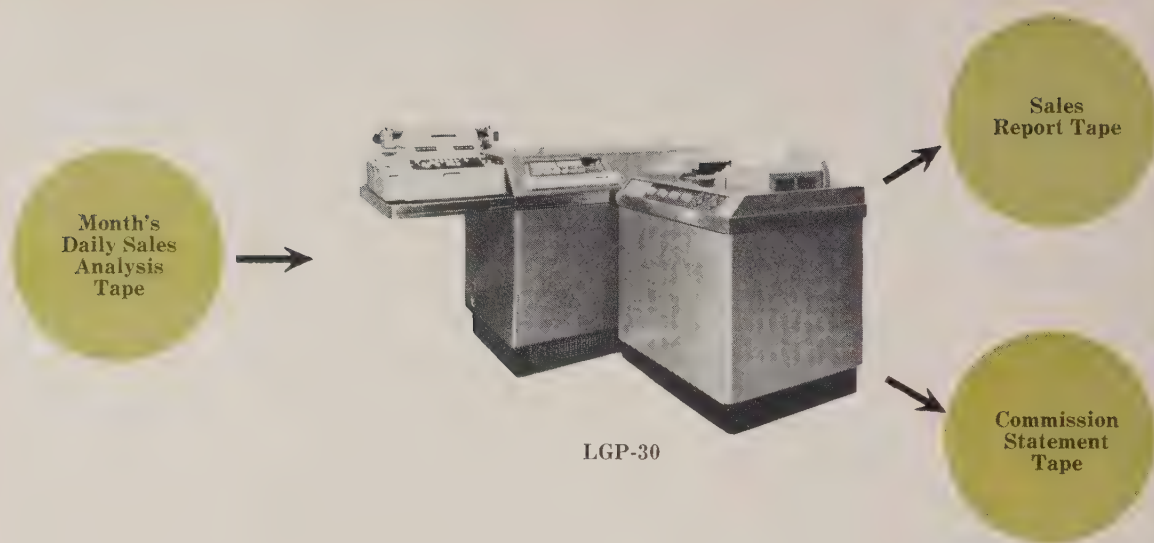
The reader picks up the data on the Customer Control Card and transmits it to the typewriter. The typewriter automatically prints out all the necessary information, including allowable discounts. Simultaneously, the same information is punched into the paper order tape.

The operator returns the Customer Control Card to the file and pulls an Item Card for each line item that appears on the customer's order. The operator then places the Item Card in the reader and types the quantity of that item which is being ordered onto the order-invoice form. All the added information regarding that item is then automatically and rapidly typed onto the order-invoice set, and simultaneously punched into the order tape.

Seven are stored

When all items on the order have been entered onto the order-invoice form and the order tape, a quick proofreading of the newly-typed order-invoice against the original order will verify the quantities, stock numbers, customer's name and other details.

Seven of the 13 copies of the order-invoice set are stored until the order has been shipped. The



remaining six copies (two packing slips, three bills of lading and an order acknowledgement) are distributed. These copies go to one of the company's 10 warehouses in strategic shipping points throughout the country or to its export office-warehouse in New Haven, Conn.

When the warehouse receives the order, it notes the quantity shipped and the quantity back-ordered, if any. Shipment is acknowledged and a copy of the corrected order is returned to the computer operator.

Now the invoicing procedure begins. The stored order tape is placed in the on-line photo reader and the remainder of the order-invoice set is placed in the tape-typewriter.

A working memory

The operator feeds the tape into the "working memory" of the computer through the on-line photo reader, and types in the quantity of the item which actually was shipped. Acting on information in its stored programs, the computer immediately calculates and extends the price, applies the discounts and reduces the inventory of the warehouse that shipped the order. At the bottom of the invoice, the computer totals the gross and net prices, adds the tax, totals the discount and prints out the net total.

While the tape-typewriter and the photo reader are being prepared for the next invoice, the computer computes and prints a sales analysis and an audit tape showing the customer's number, the item numbers, the total line items on the order

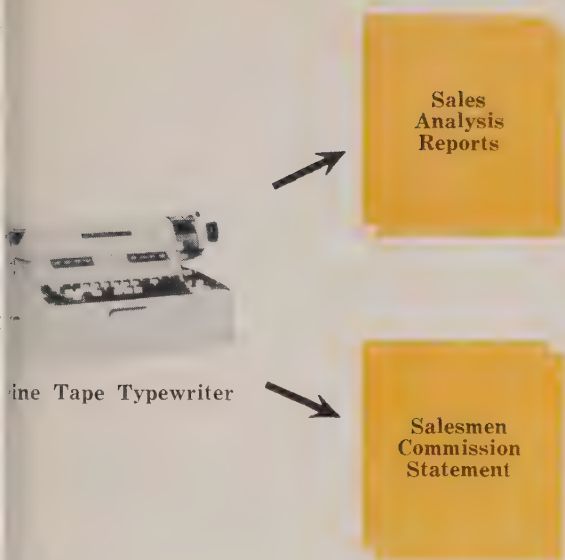
and the accounting figures. Inventory control and sales analysis, formerly independent operations, now are accomplished as by-products of the order-invoice cycle.

Since the new system has been in operation, Plastex has experienced a 90 percent drop in the number of credit memos applied to customer orders.

At present, in a six-hour day, five-day week, the computer handles: order writing; invoicing; continuous raw material inventory (showing what needs to be re-ordered); and continuous finished goods inventory, both by individual warehouse and by total for all warehouses. (The latter operation now takes four hours and always is current. It formerly took at least a week and was out of date as soon as it was completed.)

The computer also takes care of a weekly production report showing units produced, good pounds produced per machine-hour, cost of production, selling value of production, raw materials used, man-hours per job, share of overhead per job, and summary of all these figures in any form required by management; sales analysis, broken down by sales by salesman, by customer, by product sold and by state; accounting figures, including reports on gross sales, gross cost, gross profit, running cash on hand, and accounts payable; sales commissions to be paid; and payroll, including incentive accruals.

In 20 minutes, Plastex can obtain a complete analysis of the items needed to fill its orders (above inventory on hand) and/or to bring stocks of items back up to minimum inventory levels.



Flow Chart of Monthly Sales Analysis and Commission Statements

(1) Operator runs month's daily sales analysis tapes through the on-line high speed reader. (2) Following a stored program, the LGP-30 punches out a sales analysis tape for the month, and a monthly commission statement tape. (3) Tapes are run through off-line Tape-Typewriter, which types out salesmen's commission statements and sales analysis reports (breakdown of sales by customer; by products sold; by state; by salesman; and by any other classification desired).

Control of inventory is one of the most important benefits realized by Plastex since the addition of its computer. A study of inventory requirements by warehouse, prepared on the computer, permitted reduction of total inventory by 25 to 30 percent, freeing large sums of money formerly tied up in inventory, plus interest charges formerly incurred in bank loans. This was attained without sacrificing the ability of the warehouse to ship materials when required.

Down to a gnat's eye

The \$1,000 in direct savings, traceable to the use of the computer, long since has been exceeded. During several months of the year, direct payroll savings far surpassed the monthly equipment rental, and the ability of the company to reduce its inventory increased the working capital and eliminated the need for costly bank financing.

"To approximate the improvements we've enjoyed since we installed our computer, we'd have had to hire several additional people and rent or purchase one or more expensive orthodox accounting machines," says Schnorf.

"And yet, we've just begun to tap the possibilities of the computer," he adds. "Because of its ability to analyze data down to a 'gnat's eye,' we are able to obtain reports now that formerly were too cumbersome or too costly to prepare. Thus, we're now able to look into anything and everything that's going on in our business and develop programs that will create a continually more profitable operation." ■



Operator of the off-line order writer pulls the Customer Control Card from the file, places it in edge-punched card reader and new order data is entered.

Central Secretarial Pool

Solves Company Labor Problem

TRAINED SECRETARIAL HELP is at a premium in Windsor, Conn., a fact of which the management of Combustion Engineering, Inc., was aware before moving there from New York City.

But management also knew that the cost of relocating their clerical and secretarial staffs, added to the task of transferring all of their administrative, engineering and supervisory personnel, would be completely prohibitive.

The company sought a solution to this problem through a radical change in methods and procedures. By setting up a centrally-controlled dictating system to service all of the company's corporate functions, Combustion Engineering felt that it would be able to recruit the necessary local personnel to handle its output, cut operating costs and increase the efficiency of many departments at the same time.

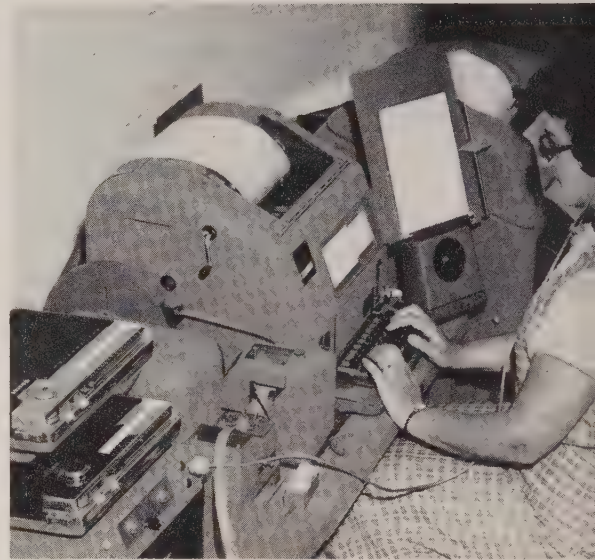
Under the new system, Edison Televoice, every executive's phone is a potential dictating instrument. Merely by dialing the proper code number, the executive may use the phone for dictating at any time. His voice is recorded on discs at the transcription center.

The recording discs are removed for transcription at scheduled periods. For example, anything dictated between 8 and 11 a.m. is removed from the recording unit by the department supervisor at 11 a.m. and returned to the dictator by 2 p.m. Anything recorded after 2 p.m. goes on the next morning's schedule.

In this way, the dictator knows on exactly what correspondence or reports he can expect a three-hour return, and he can schedule his work accordingly.

As the discs are removed from the recording unit, each is assigned to a specific girl for transcription. As soon as the girl has completed the typing, she turns it in to the assistant supervisor, who assigns it to a messenger for delivery.

All work done in the department is itemized on



Teletype, fed from the centralized transcription center, links Combustion Engineering to its seven outside divisions.

a work sheet by the assistant supervisor and the supervisor. Entered on this work sheet are the code number of the recording unit, the date, individual disc number, time "on" and "off," the minutes of dictation on the disc, the time the disc is assigned for transcription, the time the typing is completed and the number of letters on the disc.

In this way, management can see at a glance the records of individual performance, any increase or decrease in the use of the dictating units, and the overall production record of the transcription department. There is no need to conduct a special study at any time since a cumulative record always is available, and the company also is able to charge the transcription work to each of its various departments.

As a logical extension of the centralized transcribing section, a special Teletype station has



A small force of typists working from recorded dictation can keep up with the secretarial needs of all the company's executives, producing 750 pages of typed material per week, dictated from any of 550 company phones.

been set up in the department. Messages being sent to any of the company's seven divisions are handled in the same way as ordinary dictation. The sender dictates over his regular phone and the message is recorded on an Edison unit set up next to the Teletype machine. As soon as the message is recorded, the Teletype operator transfers the disc to the transcription unit and transcribes directly to the Teletype machine. Both punched and printed tape are produced.

Using the Televoice system, Combustion Engineering is able to accomplish the same amount of paper work that was transacted in the New York office, but in less time and with far less secretarial and typing personnel.

The creation of a central transcription pool was not without its problems, however. Management was careful to select girls on the basis of potential, overall ability and interest in the job at hand.

By stressing the importance of the transcription work, by showing strong interest in the girls that were hired, and by adopting a careful training and advancement policy, the company was able to achieve an unusually high performance and morale level for the department.

Girls who were selected for employment first were given a two-week training course that included a refresher in spelling and grammar; train-

ing in company methods and procedures; and an indoctrination into the use and philosophy of the Televoice system.

Bright walls, excellent lighting and the use of plants and pictures also help to improve the morale of the girls working in this department.

Because her training is broad, each girl gets to know every operation in the department. Too, she is specially trained in the position immediately above her's, thereby increasing her incentive.

In the same manner, the assistant supervisor is chosen from among the girls.

Combustion Engineering's management says that the Televoice system not only solved its secretarial problem, but it enables users to get replies, inquiries, instructions and thoughts onto paper more quickly and accurately than previous methods.

There are 550 phones over which dictation is given at Combustion Engineering, and 10 recording and 12 transcription units. The department handles an average of 1,500 pages of Televoice dictation every two weeks, with the work roughly divided between engineering reports (70 percent) and correspondence (30 percent). Heaviest users of the transcription pool are the Contract Engineering, Sales, Erection, Research and Product Development and Patent departments.■

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The "Thermo-Fax" Brand Copying Machine—the world's most versatile business machine—now does even more new jobs. And look at the savings! *Black on white, bond-weight Systems Copies for less than 2¢ a copy. *Finished Paper Printing Plates in seconds for as little as 12¢. *Ready-to-Project Transparencies for as little as 13¢. Plus many more jobs that can save you money.

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C O P Y I N G M A C H I N E S

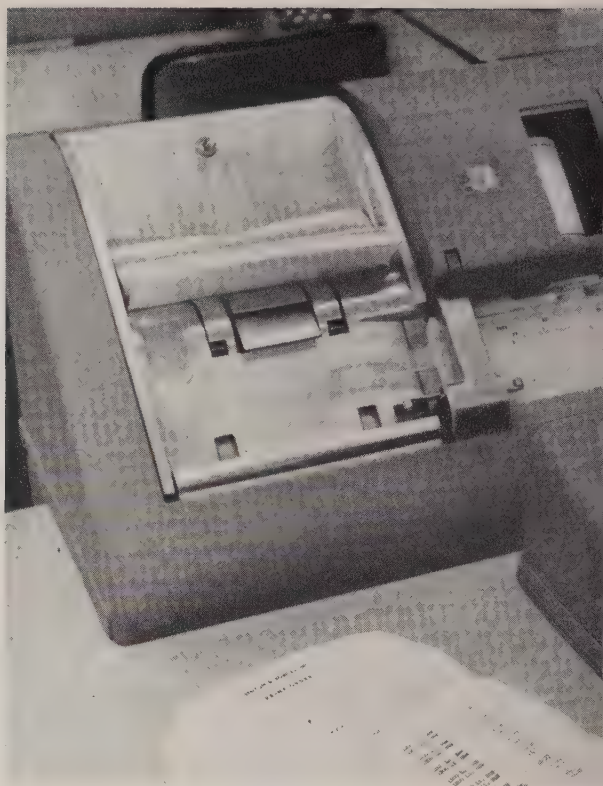


MINNESOTA MINING AND MANUFACTURING COMPANY

... WHERE RESEARCH IS THE KEY TO TOMORROW

THE TERM "THERMO-FAX" IS A REGISTERED TRADEMARK OF 3M COMPANY

Ad Game Played On Punched Cards



Rate cards of new publications, in which Benton & Bowles, prepared for master file by keypunch operator. The file is

BENTON & BOWLES, INC., one of the country's best-known advertising agencies, has doubled its size during the past five years. The expansion of services for existing clients and the addition of new clients has increased B&B's billing volume to \$114 million a year.

But, as is often the case, this rapid growth also created a need for new ways in which to handle a mounting volume of paperwork. Old methods, which had prevailed for years, became obsolete.

B&B knew that any reduction in paperwork could not result in a cut in service. In addition, any new system would have to be flexible, speedy and diverse. They decided that punched card data processing would answer their problems.

To illustrate the savings this agency has realized from its new equipment, take the example of a client who wants to place an ad in a series of newspapers. B&B's files contain pre-punched cards representing all newspapers with which its clients have dealt. Each card contains such data as the newspaper's name and address, its code and line-rate, discount, and district, division or sales area for that particular client.

When the machine accounting department receives a print order or request for an estimate, the appropriate cards are pulled and automatically

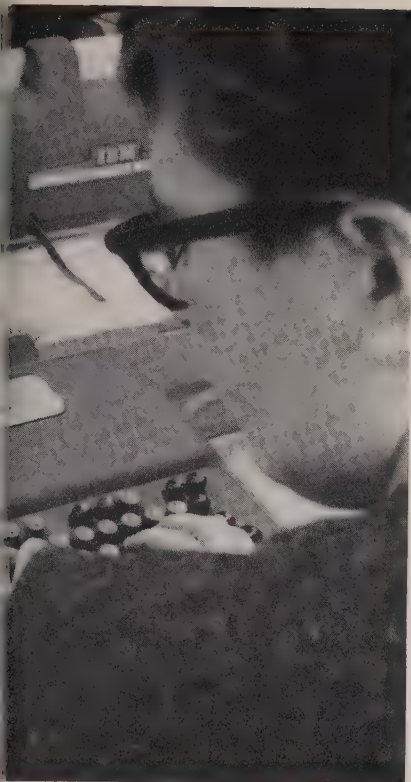
reproduced. The lineage and insertion date (or dates) are keypunched into the cards, and the client number and estimate number are gang-punched for identification.

Previously, B&B had to write the size of the ad (lineage), the name of the newspaper in which the ad would appear, and the date on which the ad would appear on 15 separate forms for each ad . . . for one client . . . for one newspaper. Today, this duplication of posting has been eliminated. The information on one punched card can be mechanically written to serve all report requirements.

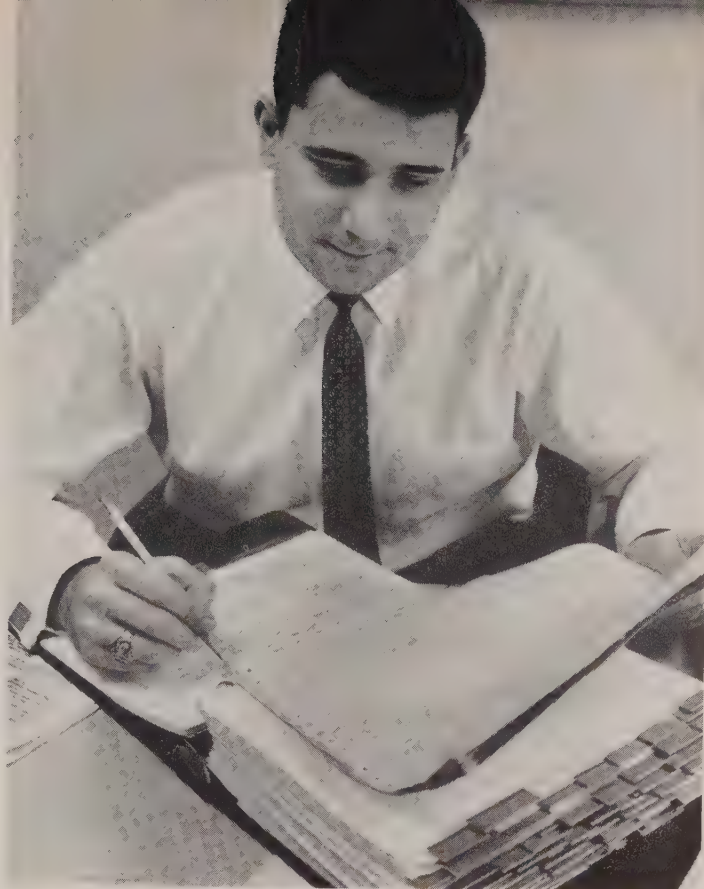
To complete the estimating and to set up records for accounts payable and billing for a single client ad scheduled in 400 newspapers now takes three or four hours. Under the old manual method, this same job would have taken a week overtime.

Under the former system, all computations for gross costs, cash discounts and net amounts were performed on desk calculators, typed on forms, and then proofread — a time-consuming process. Now, this work is performed automatically by IBM machines.

An important Benton & Bowles concept is illustrated by this newspaper ad insertion procedure: that keypunching and verifying time is the major labor cost in a punched card system.



They have occasion to place advertising, are responsible for preparing insertion estimates and invoices.



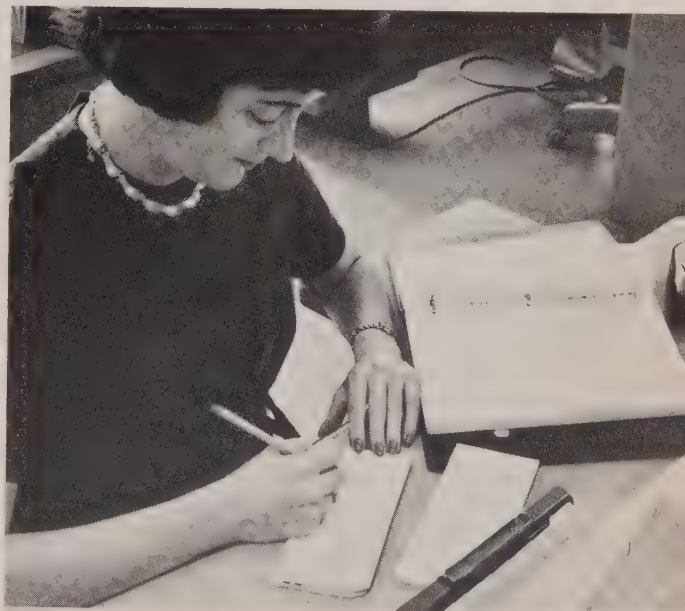
A media buyer consults a machine-prepared newspaper list for a specific area client desires to hit with an advertising campaign.

Therefore, punched card data processing is employed for a procedure only when its worth has been evaluated according to the number of times a certain document can be used. Three questions determine whether an application should be converted to punched card processing: What can be saved? It is worthwhile doing? Can it be done?

In the newspaper insertion accounting application, one card can be employed in seven to 10 different ways, all of which required considerable duplication of information and effort under the former system. They can be used:

- to write an estimate. (For some clients, insertions must be arranged in district and division order; for others, alphabetically according to state and city.)
- to calculate gross cost, cash discount and net payable.
- to reproduce accounts payable cards.
- to prepare the client invoice, either in detail or proforma.
- to compare original insertion requests against actual performance by the newspaper.
- to prepare card checks for newspaper payment.
- to automatically prepare a bank reconciliation at no expense to the agency. (Previously, this was done manually.)

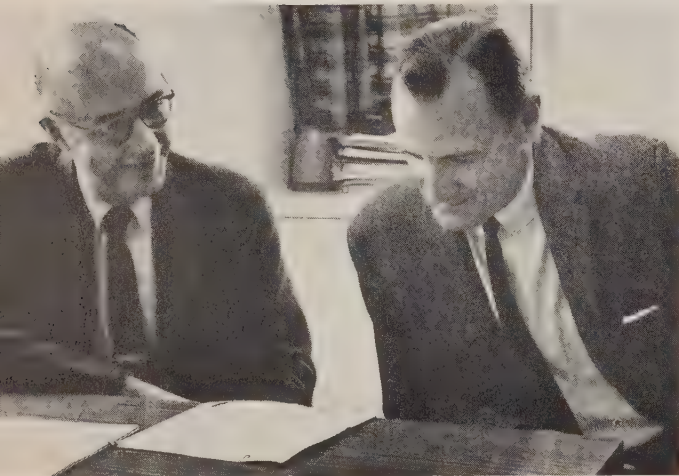
Continued on Next Page



Up-dating of rate or schedule changes are handled by the machine accounting department where estimating cards are pulled from the file and corrected.



Quarterly client cost accounting reports on work such as art reproduction (shown above) are prepared mechanically.



William Vickery, controller (left), and John Boyd, Jr., manager of data processing, discuss client cost report.

- to prepare sales analysis data.
- to prepare a cash disbursement report, trial balance and "reference report," which offers a complete audit trail for invoice and check numbers.

The procedure used for estimating television spots is basically the same as the one used for newspaper insertions. The advantages of punched card data processing are similarly pronounced in other areas, too.

In the Research Department, punched card systems are used to tabulate and profile all types of market research studies, to label address all direct

mail items, to make random selections for sampling purposes from the agency's 5,000-family Home Research panel, to report on the dependability of Home Research panel members, and to record and develop labor costs on all research jobs.

In the Accounting Department, many procedures have been mechanized in the areas of accounts receivable, sales analysis, billing reports, disbursement reports, cost accounting and talent payroll.

The nature of an advertising agency is such that there are extreme fluctuations in the accounting workload during the month. With the old manual system, this meant long hours of costly overtime during peak periods.

Even though B&B's billing volume has doubled, the utilization of IBM punched card equipment has permitted the company to handle this added demand with only minor increases in accounting personnel.

The Benton & Bowles management is quick to point out that all of this did not come about in one sweeping changeover.

In developing its punched card systems, B&B usually approached an application from the end product to the initial source; for example, from the billing operation back to the preparation of estimates.

"We started with nothing and, in general, converted function by function, one at a time," says John Boyd, Jr., manager of data processing. "Every step we made saved time, money and effort over the old way of doing things." ■

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RCA's firm commitment to a policy of responsiveness to customers' needs makes thorough "backup support" as much a part of every RCA EDP System as the "hardware" itself, with its tremendous *WorkPower* and unique versatility. In simple terms, it means that you get *more work per dollar* invested... day after day, year after year.

No matter how modest or complex your data processing requirements may be, you'll gain by talking it over with RCA. RADIO CORPORATION OF AMERICA, Electronic Data Processing Division, Camden 8, New Jersey.



The Most Trusted Name
in Electronics

RADIO CORPORATION OF AMERICA

For More Information Circle Reader Service Card No. 163

PROBLEM:

instantaneous communications between the Convair Division of General Dynamics and Delta

SOLUTION:

a Western Union Private Wire System

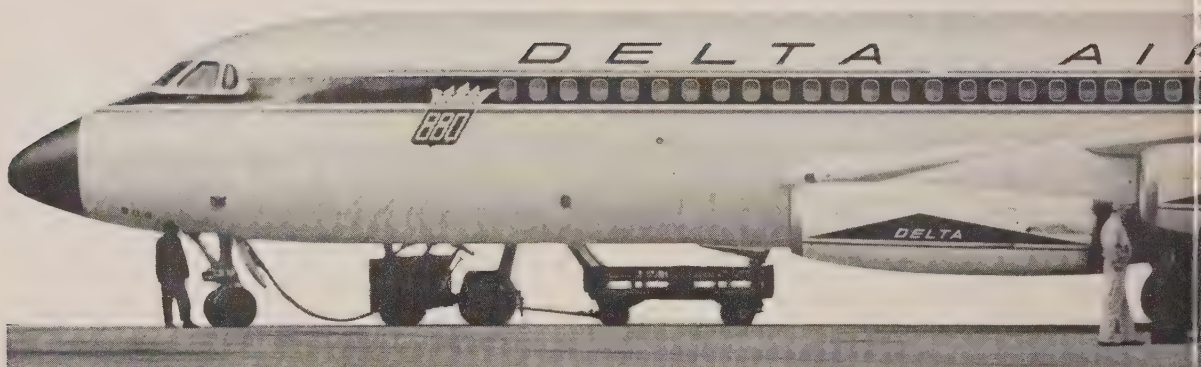
It's one thing to deliver a fleet of Convair 880 Jets to Delta Air Lines in Atlanta, Georgia. Quite another to provide daily maintenance and parts information from your West Coast headquarters!

Maintenance questions and the answers have to speed back and forth in a matter of seconds between Convair's San Diego plant and their representatives assigned to Delta's maintenance facility in Atlanta.

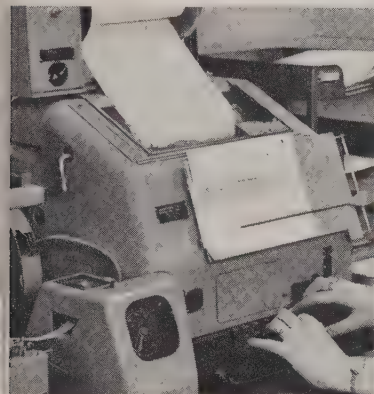
A Western Union Private Wire System performs this key communications job—and many others—for more than 75 General Dynamics locations. Each month, 45,000 written messages flash over 15,000 miles of private wire. *And each message gets through quickly—accurately—economically.*

General Dynamics can add customers and suppliers to this flexible private wire system in special situations when direct, instantaneous, two-way communications are required for extended periods of time.

Your company—like General Dynamics—can save both time and money *and* improve communications with a Western Union Private Wire System, one *specifically designed* to fit your company's needs. For all the facts, without obligation, wire collect to: Western Union, Private Wire Division, New York, New York.



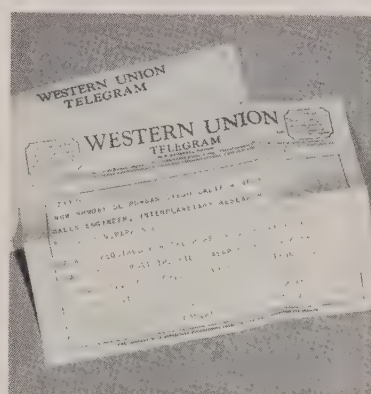
Three of the many ways General Dynamics uses its Western Union Private Wire System



Maintenance service. Convair representatives in Atlanta tape requests for information to San Diego on High-Speed Duplex System, which permits simultaneous sending and receiving. Replies speed back *in writing* at rate of 75 words per minute. Every message automatically numbered—no chance of loss or error.



Administration. Any two—or *all* General Dynamics offices—can now communicate in seconds—in writing. Special equipment permits push-button selection of offices or master-sending to all offices at once. Result: simultaneous transmission of messages to any combination of stations in the system.

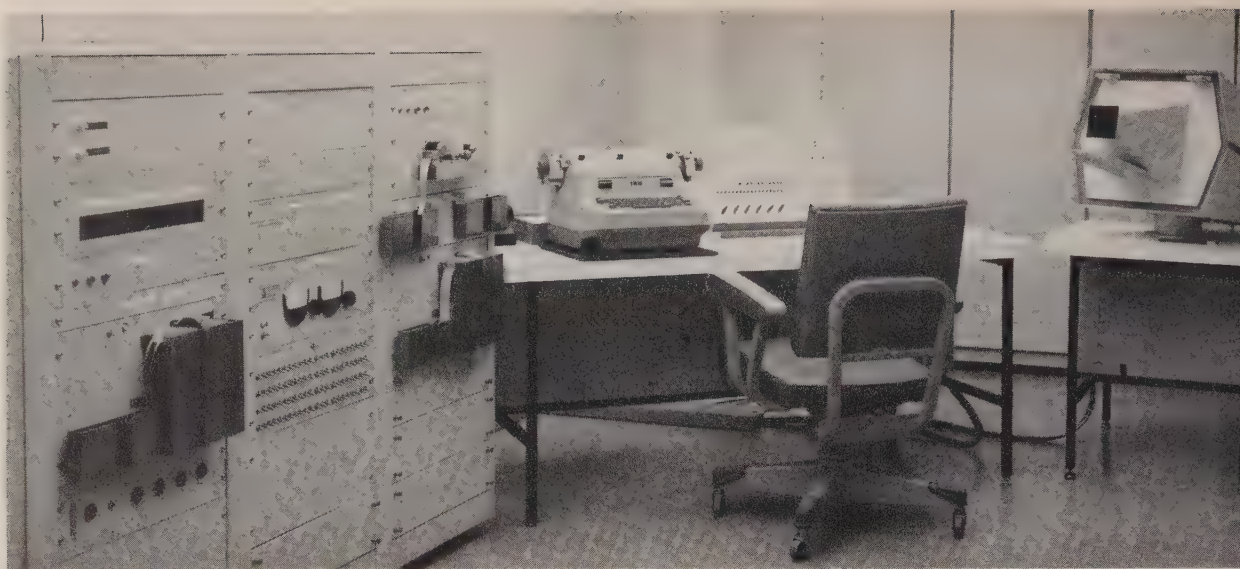


Out-of-company communications. Private wires are used to communicate with other firms at low cost and with greater efficiency. Messages speed to the General Dynamics refile location nearest final destination, then are switched to the regular Western Union Telegraph System for delivery to addressee.

WESTERN UNION...first in Private Wire Systems



For More Information Circle Reader Service Card No. 164



Digital Equipment Corp. Programmed Data Processor includes (left to right) input-output frame housing equipment, input-output typewriter, control panel, cathode ray tube display and central processor in four frames.

Product Preview

Light Pen Can Change New Computer's Data

A NEW HIGH SPEED, solid state digital computer is being manufactured by Digital Equipment Corp. and is called the DEC Programmed Data Processor (PDP). Featured in the equipment are cathode ray tube displays and light pen for direct communication between the machine and the operator.

The computer is a single address, single instruction, stored program machine. It does not require special power, subflooring or air conditioning and is designed to accommodate several types of input-output devices without internal machine changes. Five-megacycle circuits, a five-microsecond magnetic core memory and fully parallel processing make possible a computation rate of 100,000 additions per second.

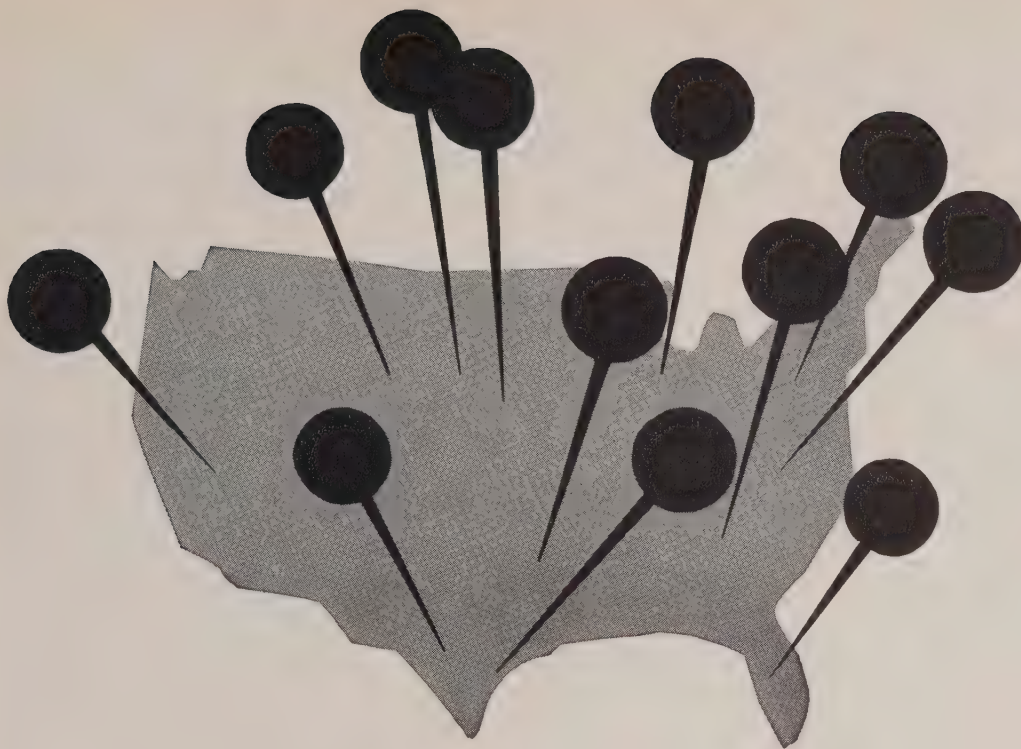
Standard equipment on the DEC computer consists of a paper tape reader, a typewriter for on-line input and output operations and a paper tape punch. Optional input-output equipment includes sequence break, cathode ray tube visual display, light pen, card punch and card reader controls, tape units and tape control units. With the pen,



The cathode ray tube, without photographing frame, shows how computer information can be changed by means of electronic light pen in the operator's hand.

the cathode ray tube becomes part of a loop input-output system. The pen detects information displayed on the tube, and the pen output sets a program "flip-flop" in the PDP each time a pulse of light strikes the pen. The program then produces an appropriate change in the display.

Built-in multiply and divide is available as a central processor option and the random access core memory is expandable in modules of 4,096 words. The price of the PDP with standard equipment and one memory bank is approximately \$110,000, or like the complete model shown above, \$150,000. Circle No. 125



Now! A low-cost way to
automate sales analysis –
Keysort® Data Processing

Today, the businessman must know exactly *what* is being sold *where*. Yet, to the small- and medium-sized company, most data processing systems that can deliver this information *on time* are prohibitively expensive. Except Keysort.

Flexibility and economy

Keysort is the only automated data processing system flexible enough to fit your business as it stands *and* as it grows. It is the one system adaptable and affordable to companies of every size. Remarkably simple to use, Keysort requires only minimum training. It imposes no restrictions on your way of doing business, yet provides the whole range of management reports – order and sales analysis, territory analysis, inventory, etc.

Reduced clerical burden

Mechanically created, Keysort cards are code-notched with your vital information. Writing is thus reduced to a minimum. Figures are automatically tabulated and summarized direct to reports. You get the information you need *when you need it*. With least effort. And at lowest dollar cost.

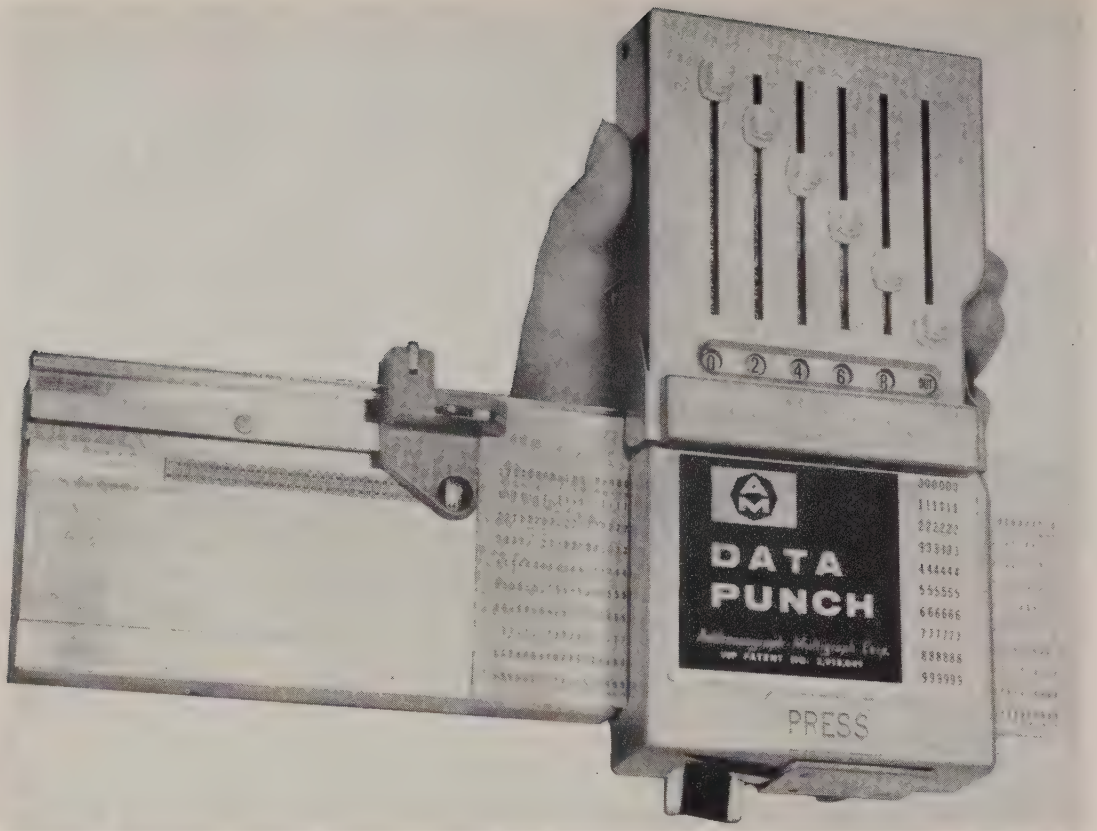
Documented case histories

Your nearby Royal McBee Data Processing Systems Representative will be glad to discuss a low-cost Keysort system tailored to your individual requirements. Call him, or write us at Port Chester, N. Y.—indicating the applications in which you are interested—and we will supply you with actual case histories from our files.

ROYAL MCBEE corporation

NEW CONCEPTS IN PRACTICAL OFFICE AUTOMATION

For More Information Circle Reader Service Card No. 165



The portable A-M Data Punch unit fits in the hand and records point of origin data on punch cards.

Portable Punch Records Data On-the-Spot

Product Preview

A PORTABLE UNIT that records and prints data in standard punch card code directly on a tabulating card at the point of origin has been introduced by Addressograph-Multigraph Corp. It is called the A-M Data Punch.

Cards prepared by the Data Punch can be fed directly into any data processing system without transcription or additional preparatory steps. It simultaneously interprets (for verification and reference) the data which is being punched into the card.

Data Punch measures $8\frac{1}{2} \times 4\frac{1}{4} \times 1\frac{1}{2}$ inches. Its weight is $2\frac{1}{2}$ pounds. After a tab card is inserted in the device, the area to be punched is selected by means of a field indexing gauge. Data to be punched and printed is entered by positioning a series of keys. What has been entered is

visible on dials for visual verification. An operating lever is depressed to complete a punched card document. Conventional 80 or 51 column cards or multiple part card sets may be used.

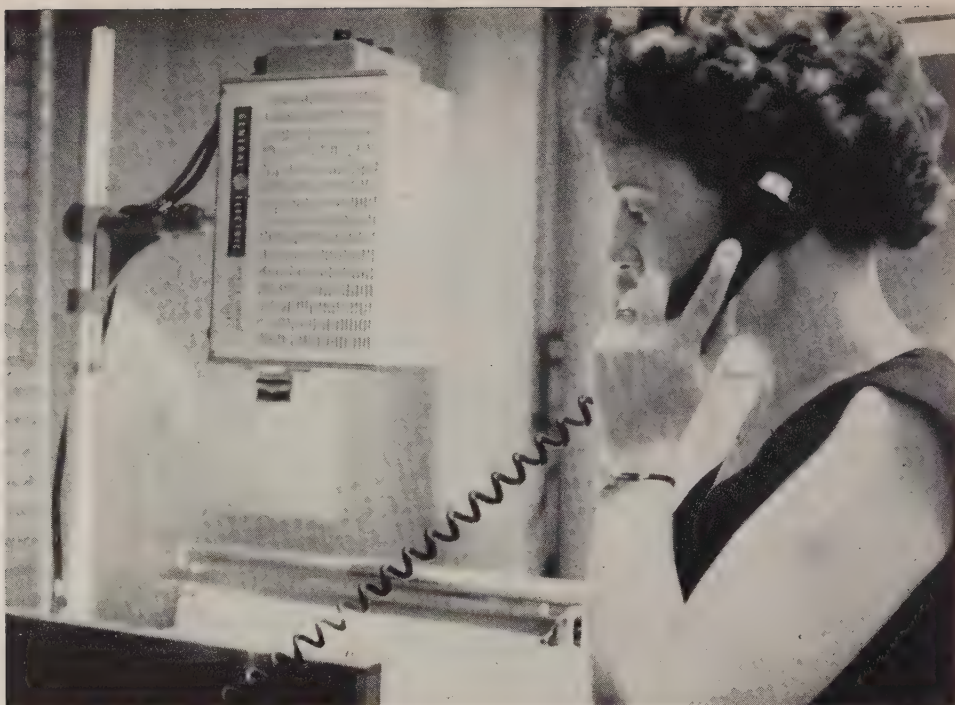
Designed to reduce key punching and proofing labor and to eliminate transcription errors, the A-M Data Punch can be used wherever source data must be gathered at locations other than the data processing site. In-plant uses might be stock requisitioning, physical inventory, tool control, machine production recording or order invoicing routines. Field uses could include meter reading, field inventory recording, route salesmen's order/delivery reporting, catalog ordering or insurance premium collection.

The A-M Data Punch can also serve as an auxiliary in the key punch department for adding information to previously punched cards, entering special codes or instructions, and in re-creating data from damaged cards. Circle No. 101

DO NEW AUTOFAX SYSTEM sends, receives *and*
ALL files all your sales reports, inventory data, messages
—anything writable—in the quickest, most accu-
YOUR rate way possible. BY PHONE! Here's how it
works: Your secretary types the informa-
PAPER tion just as she always has. At the same
time, AUTOFAX generates a coded copy
WORK on paper tape. Then you simply dial the
telephone number of your central office.
BY The information is automatically trans-
mitted by electrical "beeps" to another AUTOFAX
System which records the information permanently
PHONE —without error— on an identical
paper tape. This tape can be used

either to generate typewritten reports or computer inputs.
The first new idea in office machines in 30 years, AUTOFAX
is perfect for retail chains, large factory operations and sales
organizations—wherever paper work plays an important
part. Many days and weeks of report writing are eliminated!
Files are kept up-to-the minute! And anyone who can type
can operate AUTOFAX! Find out how AUTOFAX will start
paying for itself the moment it moves into your office. Write
for full details to: AUTOFAX Division / Communications
Control Corporation, 14707 Keswick Street, Van Nuys, Calif.





Records clerk sends information on G-E Intra-Tel transmitter camera to teller (below).

Television Aids Bank Communications

CLOSED CIRCUIT television plays a key role in banks, savings and loan associations, and other financial institutions and offices which require visual communications between stations.

Over a direct line, the teller in the "patio bank" at City National Bank and Trust Co., Kansas City, Mo., asks a record clerk for information on a ledger sheet or signature card. Using the General Electric Intra-Tel system, the records clerk places the requested records under the TV camera, relaying it immediately to the teller's monitor.

At Lytton Savings and Loan Assn., Hollywood, Calif., executives, as well as tellers, use television to see important records. The actual records are maintained in the safety of the central vault.

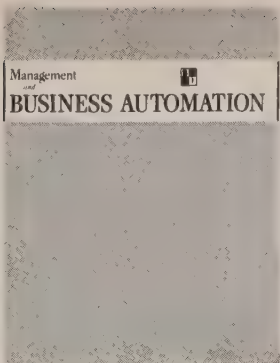
Institutions using closed circuit TV cite these advantages, says General Electric: faster and more efficient customer service, protection against lost records, tighter internal control against embezzlement, smoother office operation, better utilization of personnel. TV eliminates the necessity for creating duplicate records or depending solely on oral communications when branches or other expanded facilities are opened.

General Electric's Intra-Tel closed circuit equipment is manufactured in Syracuse, N. Y. ■



Teller's monitor displays requested information. Closed circuit systems such as these are now being used all over the country in such banks as City National, Kansas City, Mo., and Lytton Savings and Loan Assn., Hollywood, Calif.

How to catch up on your reading in a hurry . . .



Order these inexpensive reprints of top Management and BUSINESS AUTOMATION features at these special quantity prices

1-9.....25¢ each 10-24.....20¢ each
25 or more..... 15¢ each

Please enclose remittance for orders under \$3.00

1. **Jonker's Approach to Information Retrieval.** MBA interviews the inventor of the "Terminatex" system, a simple, inexpensive method of locating indexed data.
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3. **Optical Scanning—An Unlimited Horizon.** A round-up of equipment, applications and a glimpse into the future of this most exciting subject.
4. **Myth of the "Electronic Brain".** Do computers really think? A thorough examination of the question together with opinions by leading authorities pro and con.
5. **The Consolidated Functions Approach.** An insurance company's program for total automation.
6. **Business Office Sets Fast Pace for 'Space-Age' Hospital.** How a modern hospital has capitalized on business automation to operate its business side.
7. **The Office Manager—An Automation Casualty.** A critical analysis of the office manager's failure to meet the challenge of automation.
8. **A New Role for the Systems Man.** John Haslett, Manager of Methods and Procedures for the Shell Oil Co., analyzes the past, present, and future of the systems man.
9. **Punched Cards Control the Huge 'McIntyre' Market.** Teaming a card file of 36 million prospects with modern addressing, inserting and mailing equipment gives O. E. McIntyre, Inc., a high-powered direct mail operation.
11. **'Touch Stenciling' Process Simplifies Carton Labeling.** Breck Company saves \$8,000 a year by co-ordinating order processing with shipment addressing system.
12. **Automation Adds the Personal Touch to An Order-Taking Routine.** A large, motorized rotary file system transformed a routine, listless job—order taking—into one of the most important aspects of good customer relations for the world's largest distributor of Formica.
13. **New Billing Method Moves Tomorrow's Orders**

Today. How a system built around an electronic typing calculator solved the billing problems of an electronic components manufacturer.

14. **SKF Tightens Control Over Production Paperwork.** Centralization and automation of paperwork pertaining to production control at the SKF Industries, Inc.
15. **EMC . . . A New Way Out of Inventory Problems.** How one of the nation's largest department stores successfully pioneered the installation of Electronic Merchandise Control, a system designed to provide an accurate daily record of the movement of goods.
16. **Carte Blanche—the Automated Credit Card.** The Automation story behind the new giant of the credit card world—Hilton's Carte Blanche.
17. **Magnetic Ink Goes to Work.** The story of a bold leap from non automation to a new concept in data processing systems, using magnetic ink character recognition. (Case history of the Merchandise National Bank's installation.)
18. **Magnetic Tape Pays A.T.&T. Dividends.** One of the largest conversions to business automation ever undertaken by private enterprise—the records of American Telephone and Telegraph Co.'s 1,600,000 shareholders—described in depth.
19. **Major Breakthrough in Paper Processing.** The story of MICR (Magnetic Ink Character Recognition)—how it developed, its impact on the banking field, and a review of some of the equipment available.
20. **A Complete Automation System Delivers the Goods.** How a complete automation system enabled the Yale Transport Co. to reduce the time of delivery from two to three days service (and longer) provided by most carriers, to an overnight service.
21. **Automating Is a Job for Top Management.** The story of Carborundum's "total systems" concept by General Clinton F. Robinson, president of the Carborundum Co.
22. **Westinghouse Automates Engineering Drawings.** A complete description of Westinghouse's use of microfilm in punched aperture cards for the filing and reproducing of engineering drawings.
23. **Automation Pays a Million Dividends.** How automatic disbursement of stock dividend checks to over 1,600,000 stockholders of 185 corporations is saving time—and money—for the Stock Transfer department of the Chase Manhattan Bank in New York.

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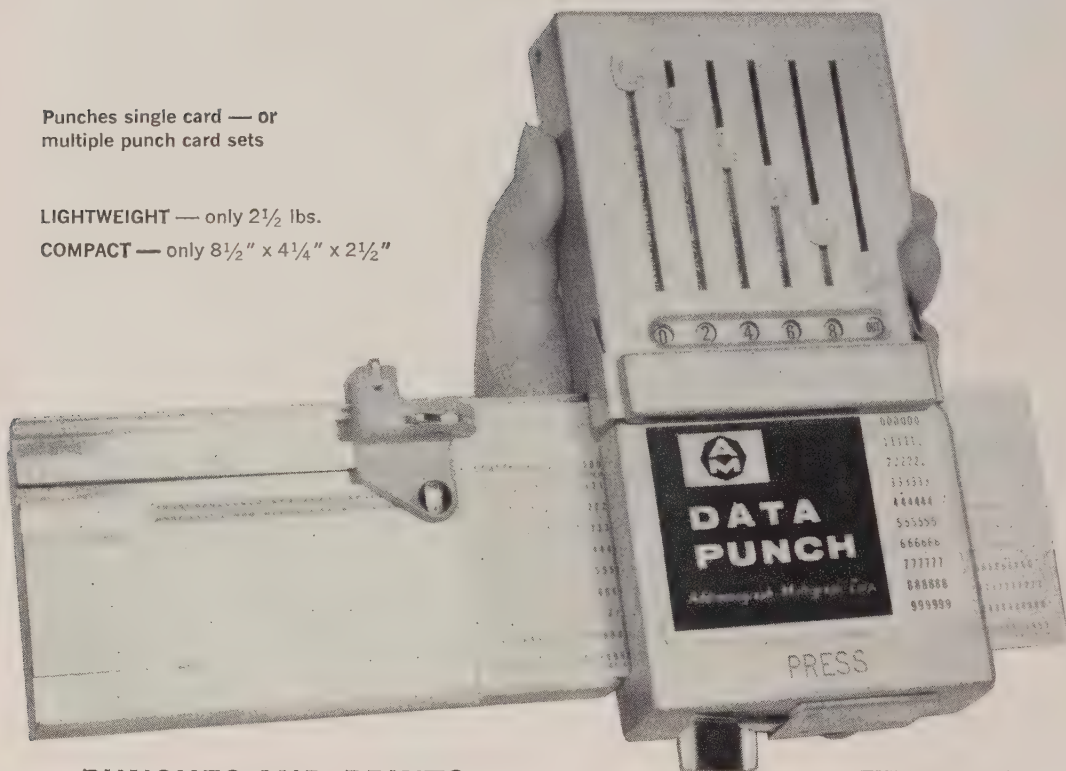
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Firm _____
Address _____
City _____ Zone _____ State _____

NEW PORTABLE ADDRESSOGRAPH DATA PUNCH

Punches single card — or
multiple punch card sets

LIGHTWEIGHT — only 2½ lbs.

COMPACT — only 8½" x 4¼" x 2½"



PUNCHES AND PRINTS UP TO 6 COLUMNS OF DATA AT A SINGLE STROKE!

Now . . . here is a truly portable, low-cost, precision machine that both punches and prints variable data right at the source. It enables you to collect data from multiple, decentralized locations in both machinable and readable form . . . accurately, speedily, simply. No electric power is required.

With the new Addressograph Data Punch you can reduce transcription errors, save keypunching and proofing labor, eliminate or reduce machine rental costs. You'll also find it a valuable auxiliary in key-punch departments . . . for adding information to previously punched cards, entering special codes or instructions, re-creating data from damaged cards.

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Addressograph-Multigraph



CUTTING COSTS IS OUR BUSINESS

Addressograph-Multigraph Corporation, Dept. B-5
1200 Babbitt Road • Cleveland 17, Ohio

I am interested in the new Addressograph Data Punch and would like:

- ☐ A free demonstration at my office
☐ Descriptive bulletin showing models and prices

Name _____

Company _____ Title _____

Address _____

City and State _____

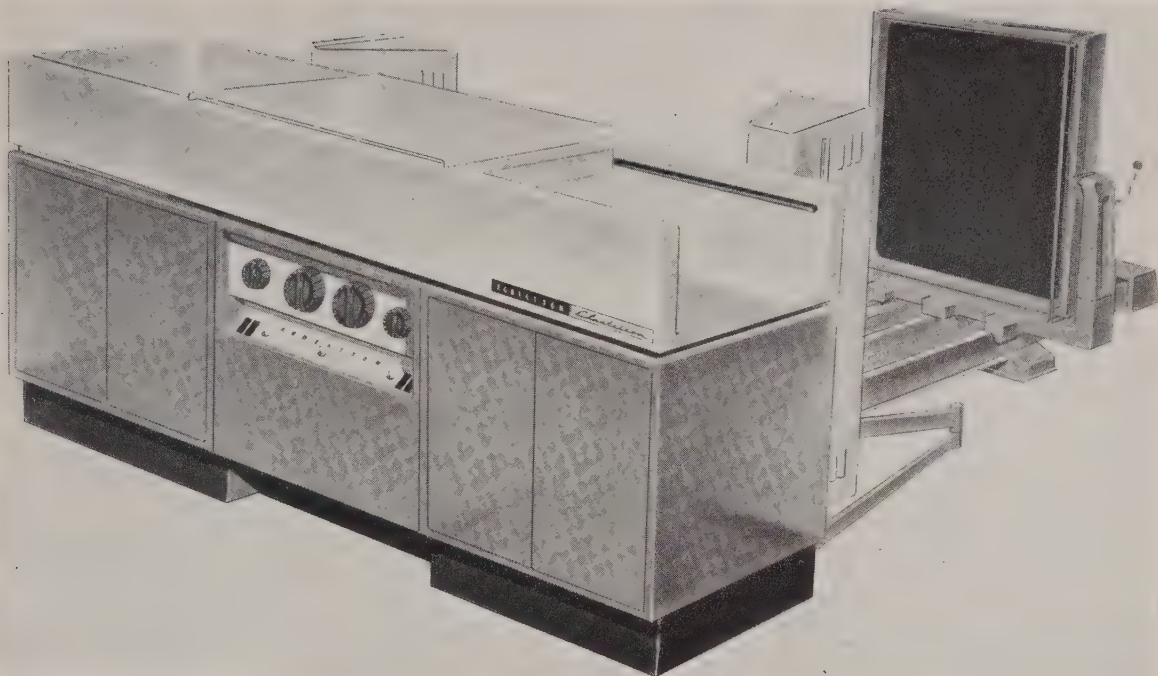
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COMPLETELY PORTABLE

Units available with Carrying Case (illustrated above) for use by field men, route salesmen, for meter reading and insurance collecting. Makes data collection easier and faster with accuracy and legibility assured.

For More Information Circle Reader Service Card No. 169



The "Electricon" can produce low cost, paper offset plates suited for short runs.

New Dry Process Makes Paper Offset Masters

Product Preview

AUTOMATIC production of low-cost paper offset plates in 60 seconds from any black and white, color, halftone, drawn, written, typed or printed material, and enlargement or reduction in size is available on a new dry process machine developed by Robertson Photo-Mechanix, Inc.

"Electricon" employs a dry, daylight electrostatic process of producing paper offset masters which are suited to short production runs, from 15 to 300 copies, on standard offset duplicators. The automatic Electricon makes a paper plate in one minute and reduces to five minutes or less the complete process of making a plate, installing it on a press and running copies in quantity.

Cost per paper master, including labor, materials, floor space and depreciation, is estimated to be approximately 25 cents each for 10 x 15-in. size in daily production of 100 plates.

Electricon combines a high-quality camera, which will enlarge copy up to 200 percent or reduce it by one-half, with an automated handling system for making the paper plate. Once material to be copied is set-up and appropriate settings made, no further operator attention is required until the finished plate is ready for removal from the machine one minute later.

The equipment was designed by Robertson specifically for reproduction departments, offices, commercial shops and blueprint departments using 75 or more offset plates per day.

With built-in quality control, operator training to produce professional quality offset masters is reduced.

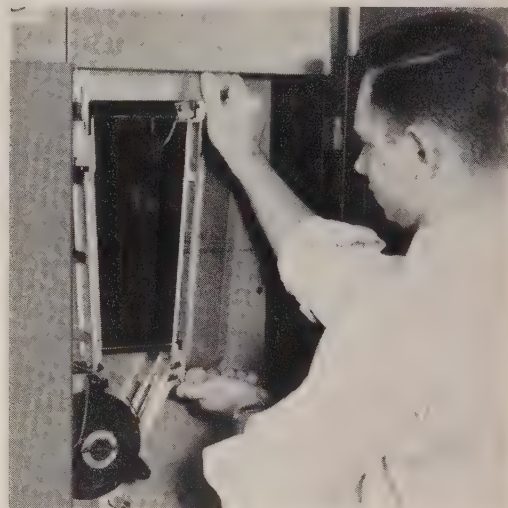
Three models of Electricon produce plates in nominal sizes of 8½ x 11-in. (Model A), 11 x 17-in. (Model B) and 17 x 22-in. (Model C). Approximate prices for the three models, including lights and plate image fuser, are \$6,500, \$9,000 and \$11,000. Circle No. 124



A unique magnetic memory card is shown with National Cash Register Co.'s Card Random Access Memory Unit.



Detail shows a "deck" of 256 magnetic cards with capacity for an eight million digit memory which can be selected from the memory file by the NCR 315 computer.



The NCR Card Random Access Memory file is expanded in a few seconds by a memory cartridge.

Product Preview

'Electronic File' Speeds Computer Performance

NATIONAL CASH REGISTER CO. has announced a new memory unit for the solid-state NCR 315 electronic data processing system.

Called Card Random Access Memory (CRAM), the memory "file" can supply, in seconds, a retail store computer system with up-to-the-minute information on a customer's credit standing and how much he currently owes the store. Used in a banking installation, information such as the depositor's checking account balance and the status of loans can be provided.

The "electronic file," says Robert S. Oelman, NCR president, can instantly select any desired records from a maze of information—information which does not have to be organized into alphabetical or numerical sequence.

"It is an entirely new concept in data processing," he added.

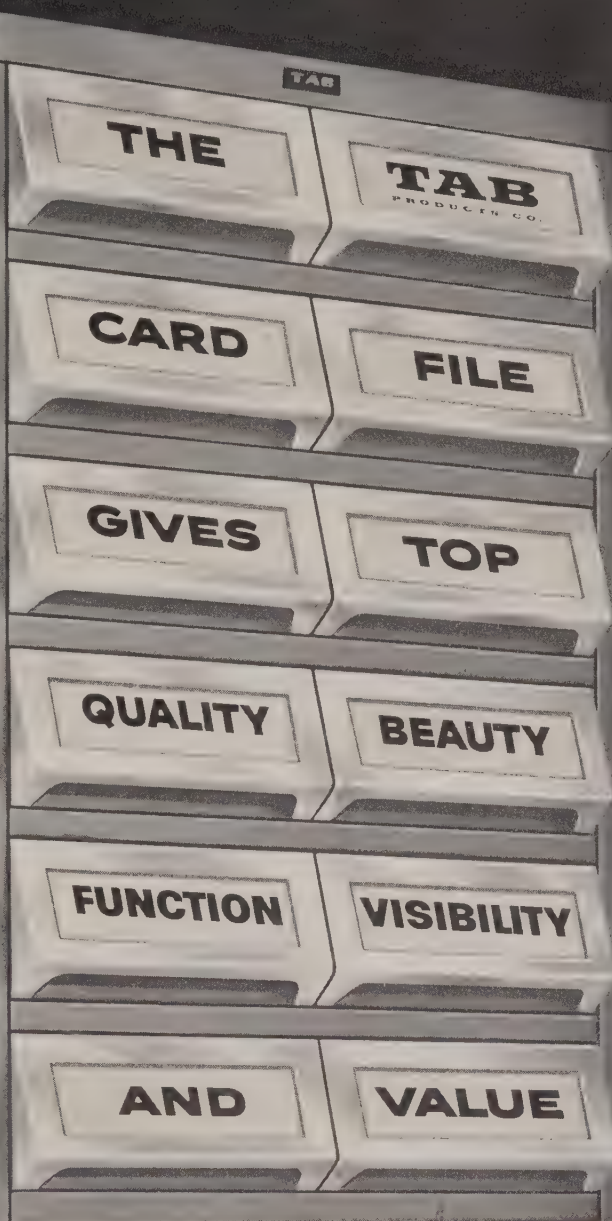
The new NCR device utilizes a "deck" of 256 plastic magnetic cards. Each card can store 21,700

letters or 32,500 digits of information. A single cartridge of 256 of these cards has a memory of 8.3 million digits and any of this information can be located and read in a sixth of a second.

As many cartridges as desired can be used with a single memory unit, and approximately 15 seconds are required to replace one cartridge with another. Up to 16 of the new memory units can be used in a single NCR 315 computer system.

The plastic cards are 14 inches long and 3¼ inches wide and are suspended from a rod mechanism. When the computer requires any given information, the proper card is released onto a rotating drum, where an electronic scanner reads the card at a speed of 100,000 characters a second.

The memory unit is priced at \$38,000 or can be rented for about \$950 a month. It will be available with the first NCR 315 computer systems, which are scheduled for delivery early next year. Circle No. 102



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What Successful Users of Simulation Have Done

If you are considering simulation work, there are several proven steps to take. This is not the only approach, but one which typifies many successful applications:

1. Identify and list key planning and operating problems where an O.R. approach may be feasible. Use the experience of others.

2. Screen your people for the required talent. You may want some outside help to begin with. If you have some O.R. talent within the company, use it.

3. Review the list of possible applications that evolve from Step 1. This should be done jointly by key management people and the group of specialists you have selected. The purpose is to refine the initial determination of feasibility by estimating for each the potential payoff and the probability for success. Pick an important problem and one which ranks high in feasibility.

4. Budget time and money. Schedule regular top-management reviews to assess the program.

5. Set up a team including the appropriate O.R. specialists and managers from the area of the company involved in the problem. The team's responsibility will be to:

- Define the problem and get acceptance of this definition and the goals sought in its solution.

- Identify and gather the required facts.

- Build an initial model.

- Select an appropriate computer—if one is needed—and then program the model.

- Test the model.

- Evaluate the first set of results and make revisions to the model when appropriate.

- Begin using the model as a decision-making tool.

6. Start early to lay the groundwork for implementation. This means careful coordination—keeping all key people informed of progress and the findings of the simulation work. Results and conclusions should not come as a surprise to those who will be affected.

7. Unless you have a suitable computer, make early arrangements to rent the time required.

Forecasting

Continued from Page 19

steps one can follow to be assured of success in using a computer to simulate business problems or to build a suitable mathematical model, there are a few significant guidelines one can observe. These guidelines, representing the sum of experience from many companies, can be condensed into three:

1. Start modestly. Pick a project with high payoff potential and a good chance for successful completion. If this one works and other opportunities for using simulation and computers exist, you can expand these facilities then with some concrete results on which to build.

2. If necessary, use outside skills and computers to begin with.

3. Familiarize and train thoroughly, throughout your company, in the methods of operations research and computer know-how. The depth and sophistication with which this is done should be tailored to fit the needs and extent of participation of operating or management personnel.

Simulation is not a panacea. In many situations, other methods of problem-solving are quicker and more economical. In fields of personnel and organization planning, the inability to quantify facts make simulation unfeasible. When it can be used, simulation is often costly in time and money. Pay-off potential must be significant to warrant its use.

Overall, however, simulation has wide application in business. It helps management deal with large and complex problems more effectively than was possible before. It can be used to study the inter-relations of decisions within a company and to examine a great many alternatives before making a decision.

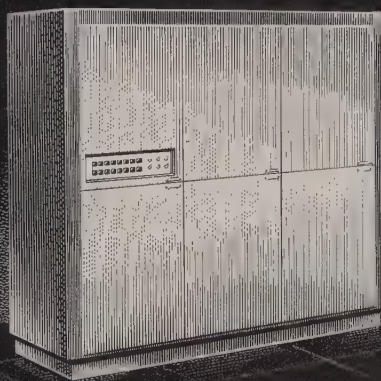
The key to successful use of this new tool is to apply it in areas where it provides maximum return for its high investment cost. ■

About the Author

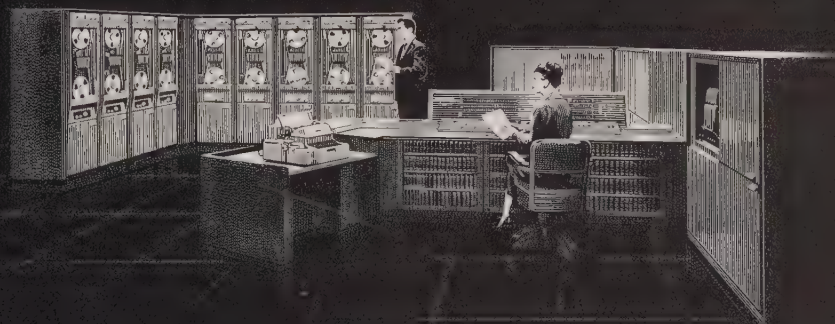
Winston C. Dalleck, an associate in the Chicago office of McKinsey & Co., Inc., management consultants, received his B.A. and his M.B.A. in statistics and quality control at the University of Chicago. He is the author of many technical papers and has spoken before numerous management groups and technical societies. Prior to joining McKinsey, he served as Superintendent, Quality Control and Applied Statistics, for United Air Lines, Inc. Dalleck is also co-author of the recently published book, "Decision Models For Inventory Management," with R. B. Fetter, and published by Richard D. Irwin, Inc. (Homewood, Ill.), 1961.

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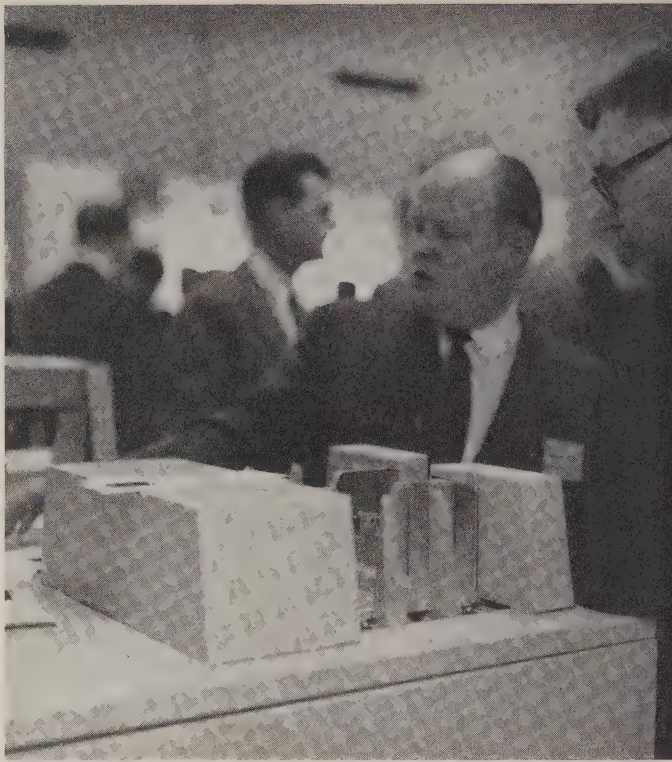
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Microfilm's Mission Is Information Retrieval, Delegates Are Told



Minnesota Mining's Vern Fosse (left) explains the company's Uniprinter 041 to J. A. Cotner (right) of American Telephone & Telegraph, New York City. Uniprinter 041 produces Duplicard copies of Filmsort aperture cards.

DELEGATES to the 10th annual convention of the National Microfilm Assn., held April 4-6 at the Hotel Sherman, Chicago, heard Richard Leghorn, president of ITEK Corp., describe the retrieval of information as "a basic national problem."

"Past benefits of microfilm as a space-saver," said Leghorn, "now are being over-shadowed by microfilm's contribution as a part of the total information retrieval system. Microfilm can produce information in a form which people, regardless of their aptitudes, can use; and hence, it is a vital inter-connector in modern retrieval systems."

Urging users and manufacturers to adopt the "total systems" outlook, rather than to approach microfilm as a system all its own, he predicted that new developments in scanning will revolutionize read-out, that microfilm will become less complex and less expensive in the future, and that there will be more and more short-cuts developed for coding, indexing and abstracting.

Leghorn also foretold the stand-

ardization of language between machines and predicted that future information retrieval systems will take data off cards which contain both a picture and a strip of magnetic information.

To speed the realization of these goals, Leghorn said that the members of the microfilm industry should (1) help to identify information retrieval as a basic national problem; (2) strengthen the partnership between industry, science and government; (3) focus the efforts of science and technology on the information problem; and (4) utilize established management techniques to harness the results of science and technology as it investigates this problem.

"If we can do all of these things, we'll again be in an excellent export situation," Leghorn pointed out. "We're way ahead of the rest of the world in the development of this equipment, and our world market is as eager for its benefits as we are. Gigantic world markets await the results of our coordinated efforts."

The three-day microfilm convention included other interesting talks on such topics as:

"Microfilming Records — a Management Approach," by John Caton, Illinois State Records Advisor.

"How to Conduct a Feasibility Survey," by William Burleigh, Jr., Microinsurance, Philadelphia.

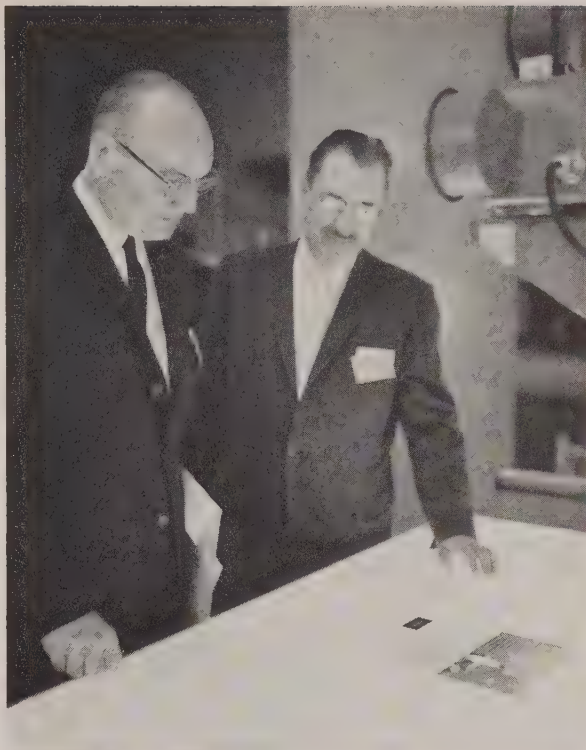
"The Economics of Microfilming: a Comparison Between Contract Services and a 'Do It Yourself' Program," by Frederic Luther, president of the association and president of The Frederic Luther Co., Indianapolis.

"Short Cuts to Automation," by George McMahon, Westinghouse Electric Corp., Lester, Pa.

Exhibitors at the convention included the Eugene Dietzgen Co.; Keuffel & Esser Co.; Photostat Corp.; N. B. Microjacket Corp.; Milco Mfg. Co.; Minnesota Mining & Mfg. Co.; Prestoseal Corp.; Systems Management; Recordak Corp.; Haloid Xerox, Inc.; Alves Photo Service, Inc.; Charles Bruning Co., Inc.; Documat, Inc.; Watland, Inc.; Plastic Coating Corp.



Printed matter from Haloid Xerox 1824 is inspected by Karl Kraus (center), Kraus, Weiss & Co., Munich, Germany, and Haloid's Cliff Bowes and Robert Courant (left and right).



Bruning Dea-Graph is shown to Lawrence Lathrop (left), U. S. Department of Commerce, by Bruning's Fred Arthur. Dea-Graph microfilm cameras are adaptable to numerous government applications.

Technifax Corp.; Microseal Corp.; Remington Rand Div., Sperry Rand Corp.; Dyna Color Corp.; Frederic Luther Co.; Burleigh Brooks; Canadian Applied Research, Ltd.; Photo Devices, Inc.; Armed Forces Supply Center; Industrial Design & Service; Andrews Paper Co.; Stromberg Carlson Div., General Dynamics Corp.; G.P.L. Div., General Precision, Inc.; Douthitt Corp.; and Society of Reproduction Engineers.

New officers elected by the convention delegates are Carl Nelson, Bell Telephone Laboratories, New York City, president; D. W. McArthur, Minnesota Mining & Mfg. Co., St. Paul, vice president; and T. Wistar Brown, Microsurance, Inc., Philadelphia, treasurer. Vernon Tate remains as executive secretary, with offices in Annapolis, Md.

The 1962 National Microfilm Assn. convention will be held at the Mayflower Hotel, Washington, D. C., April 25-27.



Recordak's Joseph Putlock demonstrates firm's Starlet Reader, one of exhibits displayed by 30 manufacturers represented at recent convention of National Microfilm Assn. in Chicago.

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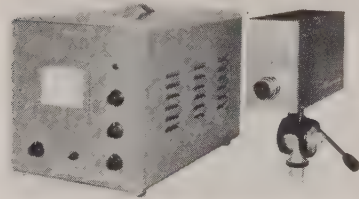
Business Automation Showcase

Jet Press



A new addition to their line of sheet fed, letterpress printing presses has been announced by Halm Industries Co., Inc. The Jet Press Model JP-10 utilizes the Halm patented, oscillatory vacuum feeds for high speed, low cost printing of office and factory forms, closed and open-end envelopes, letters, tabulating cards, tickets, labels and tags. Capable of handling a wide variety of sheet stock ranging in size from 5 x 7½-in. to 18 x 22-in., Model JP-10 operates at speeds of about 15,000 impressions per hour, using one rubber printing plate on the impression cylinder. Precise registration is maintained at all speeds. It is engineering for a minimum of make-ready. Circle No. 118

Telephone-TV System



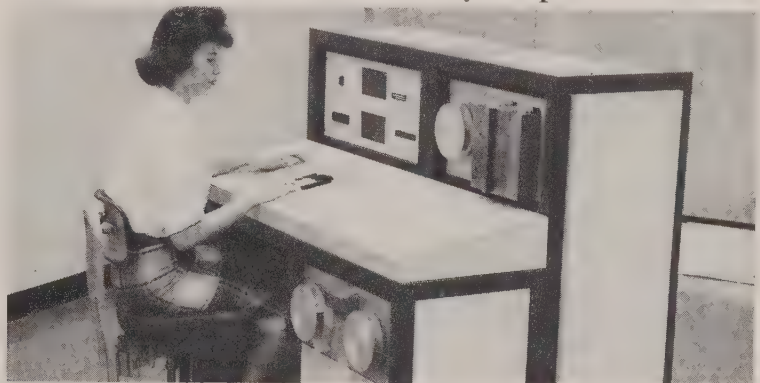
The Videx telephone line television system is now commercially available from ITT Laboratories. It is capable of transmitting a 400-line resolution image over a standard telephone line in 60 seconds. Designed to transmit all types of images, including charts, sketches, maps and three dimensional subjects, the Videx system consists of a slow-scan Vidicon camera with camera control and transmitter unit and a direct view storage tube monitor with receiver unit. Both units are completely transistorized and hand portable, the entire system weighing less than 100 pounds. Videx is normally connected to a single conventional telephone line. Circle No. 109

Card-to-Tape Converter



A universal code card-to-tape converter, the Model K-177, has been announced by Systematics, division of General Instrument Corp. The converter perforates five to eight-channel tape of any code structure and of any width from 11/16-in. to 1-in. The model is engineered for attachment to any IBM 024 or 026 card punch. With Systematics K-177, a standard card punch does double duty, both as a key punch and a card-to-tape converter. Another feature of the converter is the 540 double-hub removable, programming plugboard, permitting "plug-in" re-programming for different applications. Circle No. 106

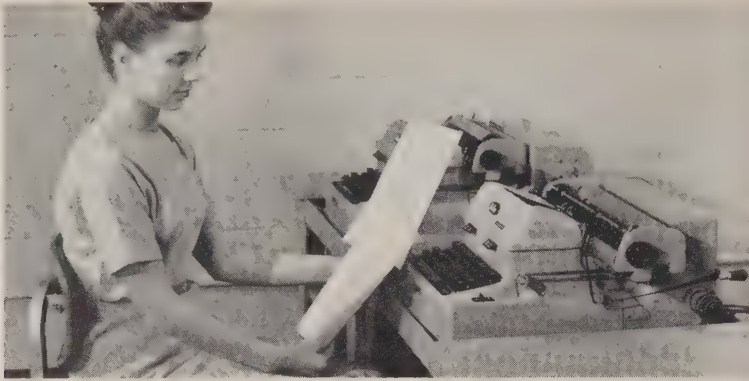
Tape Programming Automatically Prepared



McDonnell Aircraft Corp. has announced an advance in the technique of punched tape programming for business, industrial and military operations. An electronic installation known as TAPE (Tape Automatic Preparation Equipment), designed and developed by McDonnell, is said by the company to be able to produce perfect punched tape at less than half the cost and in less than one-third the time required by standard computer preparation methods. The TAPE system achieves this saving by its ability to automatically program the punched tape. The machine's logic circuitry ana-

lyzes work group and keyboard commands, converting them to complete coded programs. Finished tape is delivered instantly by punching mechanisms. TAPE can edit, verify, duplicate and correct the punched tape automatically in one unit. Operator training is minimized. A prototype system is now operating in McDonnell's new Electronics Equipment Div. and prepares tape for the AN/GJQ-9 missile and aircraft automatic checkout system. Systems utilizing punched tape can employ the system with minor modification on the keyboard and logic circuitry. Circle No. 105

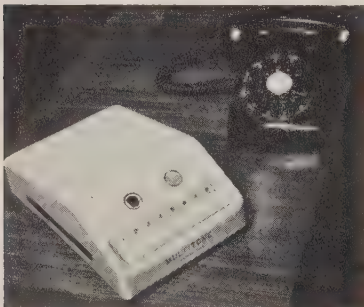
Justowriter Tapes Produce Different Type Faces



Fully justified copy can be automatically produced in different type-faces and sizes on both typing units of a Justowriter, tape-operated composing machine manufactured by Friden, Inc. The innovation is a motorized tape punch, cable-connected to a Justowriter reproducer. As the reproducer justifies copy from tape previously punched on a Model AA recorder, another tape can be copy-coded by the motorized punch. This tape is then run through the Model AA's reading mechanism to automatically compose even-margin lines in another

type face. This makes the preparation of aluminum or paper plates, or reproduction proofs, on both the recording and reproducing machines, economically feasible. Incorporating a motorized tape punch permits tape to be duplicated at higher speed, because error corrections and justifying codes have been dropped out. In addition, proof copies may be typed faster, tapes may be filed in less space, composing time is less and updating is simpler. For companies with their own printing departments Justowriter provides low cost facilities. Circle No. 103

"Baby" Transmitter



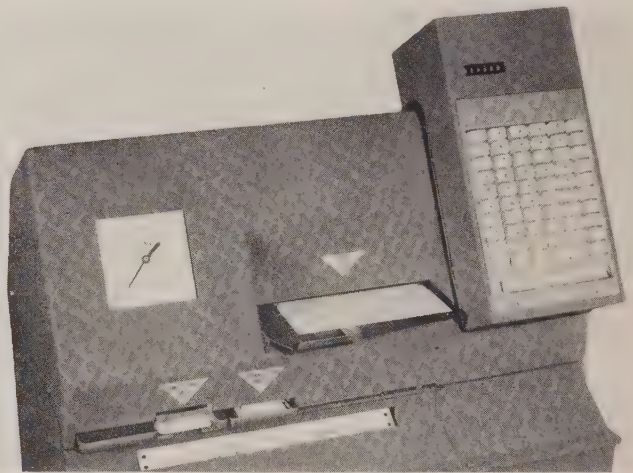
A battery-operated transmitter weighing three pounds is the nucleus of a new personal call system developed by Multitone Electronics, Ltd. Fully transistorized, independent of the power supply, the system makes an economical pocket paging system in smaller offices, plants, hospitals, libraries and hotels. Coverage varies from 40,000 sq. ft. to 300,000 sq. ft., depending on layout. The 15-channel set-up provides either speech or private coded signal for a total of 15 personnel carrying five-ounce pocket receivers. Installation is economical and operating costs are under five cents a day. No radio license required. Circle No. 121

Folding Partition



The new "Modernfold" partition, introduced by New Castle Products, Inc., features advanced noise control. "Sound insulating characteristics of a solid masonry wall," states the company, describes the Modernfold Soundmaster 240. The steel-lined folding partitions silence 41.8 decibels of sound, certifies Geiger & Hamme Laboratories. Use primarily will be in offices and institutions requiring flexibility and privacy. Moderately priced, they are available in sections up to 25 x 60-ft., but a number of sections can increase width. Various colors and materials available. Circle No. 112

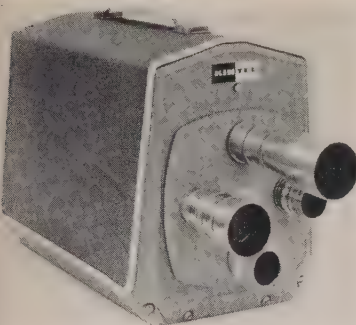
Automatic Entry System Records Employee Activities



Using embossed plastic plates, integral time clocks, prepunched tab cards and keyboard as input media, operating personnel can record their activities on the Stanrecorder automatic entry device introduced by Standard Register Co. The new electromechanical unit eliminates the necessity for any manual transcribing of such information by recording the data in both machine and human language at the source.

Information concerns the man, the operation or location, time in and out or started and stopped, order or other document numbers and all necessary variable information. Stanrecorder is said to be fast, portable and accurate. The machine is modularly constructed, allowing combinations and options for particular needs. It holds 3,000 documents in operating position and can store another 3,000. Circle No. 126

Television Camera



A new, self-contained closed circuit television camera, the 20/20, has been announced by the Kin Tel Div. of Cohu Electronics, Inc. The high quality camera includes both camera and camera control circuits in one unit. A monitor or home TV receiver completes the system. An alternate Fineline generator may be installed to use with a Fineline monitor giving high resolution, both vertically and horizontally. Other optional features include remote drive for the four-lens turret, lens focus and a variable neutral density filter to permit operation over a wide range of light conditions. Price of the camera is \$1,400. Circle No. 117

Loudspeaker Station



A loudspeaker that can both receive and transmit messages, providing "hands free" internal communications for busy employees has been introduced by Tele-Norm Corp. Integrated with all Tele-Norm private telephone systems, calls on the station are initiated through any dial or push-button phone and broadcast over the loudspeaker. The loudspeaker may be automatically shut out upon lifting the receiver on an intercom phone. The unit is expected to be useful in offices utilizing pools of specialized workers such as secretaries and credit clerks, plant production and assembly areas. Circle No. 115




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The new DOCUMAT Reader-Printer is distributed and serviced by the Charles Bruning Company, the Photostat Corporation and selected independent dealers.

For More Information Circle Reader Service Card No. 173



Child's play

Any person who knows basic arithmetic—even a school child—can quickly master the operation of the Friden calculator. The reason? Unlike other machines, the Friden has a *separate multiplier keyboard*. One number goes on the main keyboard, the other on the multiplier keyboard. A control key is touched, the answer appears.

Because this exclusive system *duplicates the natural method of solving arithmetic problems*, operators learn the machine more quickly, operate it more rapidly, make fewer errors.

The multiplier keyboard is just one unique feature of the Friden. Actually, it performs more figurework steps without operator decisions than any other calculator. (The Friden is aptly called, "The Thinking Machine of American Business.") Your local Friden Man will gladly demonstrate. Or write: Friden, Inc., San Leandro, Calif.

THIS IS PRACTIMATION: *automation so hand-in-hand with practicality there can be no other word for it.*

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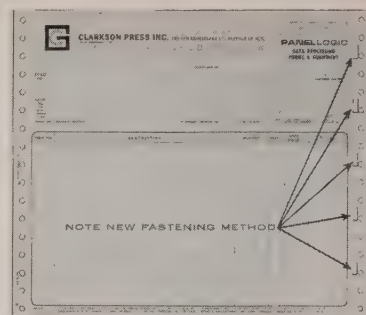


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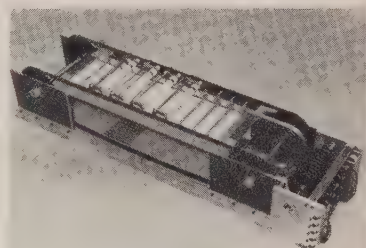
For More Information Circle Reader Service Card No. 174

Forms Fastening Method



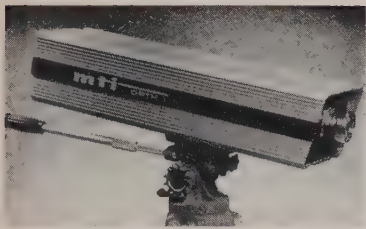
A new method for fastening Graphic Control Corp. forms has been devised by the company's subsidiary, Clarkson Press, Inc. Called Tab-Flex, the method for fastening continuous forms features tiny flaps cut in the margin and glued from part to part, holding the form permanently, yet flexibly. The carbons are lightly glued to each part outside the perforation. Advantages of such fastening are: Smoother feeding in machines, better registration, less bulk by not having to use staples, easy carbon extraction either side-snap by hand or deleafing by machine, and the Tab-Flex cross-perforating blades are essentially designed for more positive bursting. Circle No. 114

Sorting Control



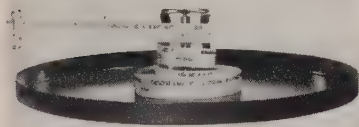
Rabinow Engineering Co., Inc., has announced a line of compact, high speed sorting equipment called the RSC. The units are available for sorting to 16, 64, 256 or 1024 categories. Destinations in the sorting program may be changed without any special tools or skills, while the proven design provides trouble-free operation for long periods of time, the company says. RSC's are useful for package sorting, assembly line deliveries, warehouse routing, conveyor delivery of manufacturing components and has been used in letter mail sorting. Circle No. 123

Closed Circuit TV



A new low cost, lightweight, portable closed circuit television system for versatile applications, including low light-level operation, has been announced by Maryland Telecommunications, Inc. Priced at \$7,500, the MTI Orth 1 closed circuit system uses special circuitry and use of both transistors and vacuum tubes. The company points out that quality pictures may be broadcast in only one foot candle of light. The complete system consists of the MTI Orth 1 image orthicon camera, camera control and monitoring equipment. It is suited for underwater work, night-time viewing and dark area inspection, as well as inspection of automatic processes, quality control checks, education and training, meetings and conferences, data handling and other observation methods. Construction is of aluminum. Circle No. 116

Tape Unwinder



A 12-in. Cycle unwinder has been announced by the Cycle Equipment Co. as matched equipment for Cycle Universal Tape-Minder (an automatic tape winder of 1-in. perforated message tape or data processing tape as it is produced). The No. 302 unwinder is sturdily constructed and balanced, featuring ball bearing mounted engineering. A guide (shown at left of picture) permits tape to travel up or down, right or left, so that no special positioning is required of the unwinder for efficient delivery to equipment receiving the tape. It has a non-scratch felt base. Circle No. 110

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A YEAR TOO MUCH
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If you regularly address 5 or more cartons per shipment, you might be shocked to find out how much it is costing you to address your multiple shipments with antiquated, repetitive methods.

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① As a by-product of office procedure

Your present method of preparing your invoices, orders, bills of lading or shipping papers can also prepare STEN-C-LABLS at the same time. Whether you use manual or electric typewriters, electric billing or accounting machines, slave machines or various magnetic tape and punched IDP systems, there's a STEN-C-LABL to fit your requirements.

② By making unlimited impressions direct to cartons, labels or tags

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Also available in Canada.

Circle Reader Service Card No. 187

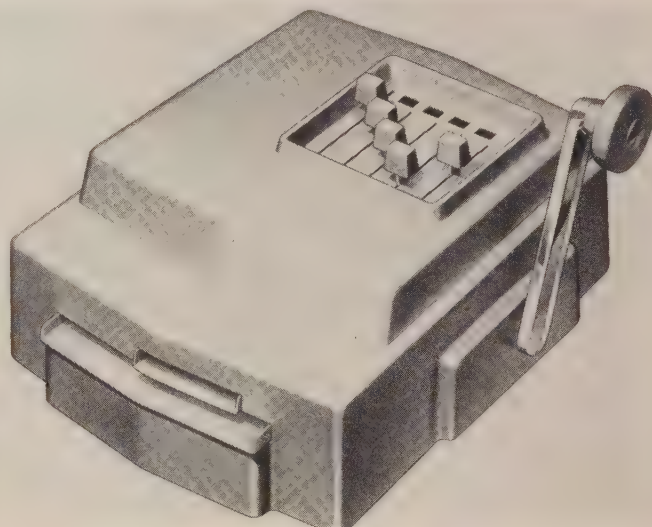
Pressure Sensitive Labels For MICR Checks



Avery Label Co. has introduced special pressure-sensitive labels to extend the bottom portion of mutilated checks prepared for Magnetic Ink Character Recognition. Labels measure $\frac{7}{8} \times 5\frac{7}{8}$ -inches and extend the bottom portion of the check $\frac{5}{8}$ -inches. Labels are coated along one edge with Perma-Grip adhesive, and are dispensed by an Avery machine engineered for exact application on the check. This method

provides a simple means of re-encoding the check without creating a special card. The re-encoded checks are carried through the sorter along the bottom edges. Addition of the label to the checks raises them so that the old imprint cannot be scanned. The new one, on the label, is visible to the machine, so that checks can be sorted, routed and computed, and a balance secured. Circle No. 104

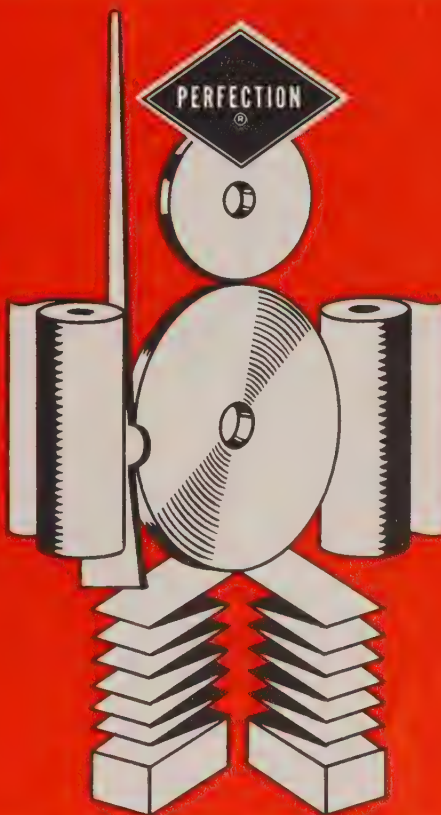
Point-of-Origin Card Punch and Printer



The Source Data Recorder introduced by Datanamics, Inc., will help "break a bottleneck" in credit card transactions by punching and imprinting cards at point-of-origin in preparation for automatic machine accounting. This eliminates the need for transferring account and

transaction figures into punch cards at a later time. Datanamics, Inc., is a recently-incorporated company and has been offering the Source Data Recorder to a selected list of firms, such as gasoline stations, banks, hotels, restaurants, and department stores. Circle No. 107

IN DATA PROCESSING PERFECTION[®] IS YOUR PROTECTION



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DATA PROCESSING TAPES DESIGNED BY SPECIALISTS

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There are many data processing tapes on the market today, all with certain characteristics. But when you want the brand that combines ALL the good features of ALL of them, and the one that assures unexcelled performance from your machines—then specify PERFECTION.

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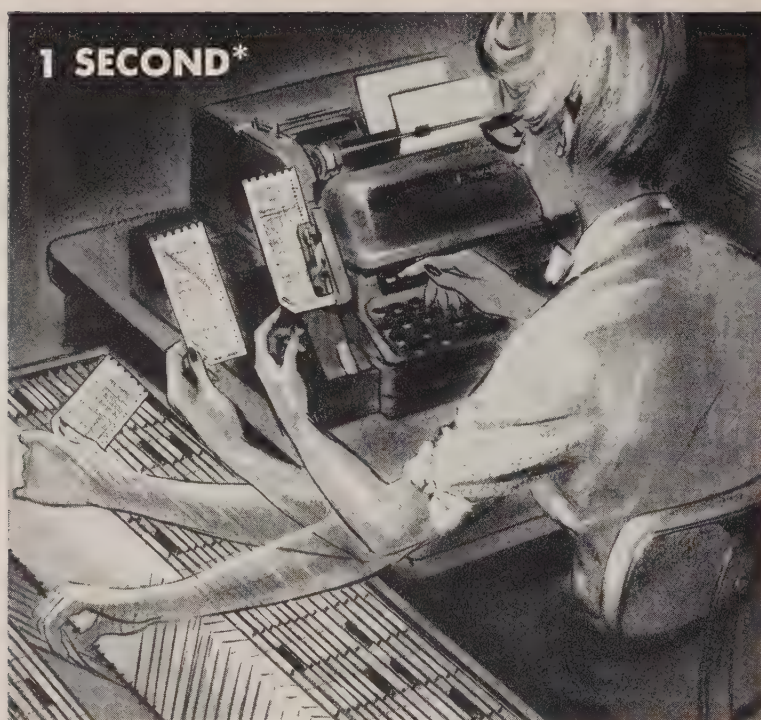
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**No idle machine time here.
Time from file to reading head—**

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VISIrecord speed and convenience, minimizes floor space requirements, operator fatigue — and increases productivity and accuracy.

VISIrecord speed eliminates costly idle machine time on automated applications, and complements machine efficiency — the programmed edge-punched card input easily keeps pace with the most modern machines.

VISIrecord's split-second refiling, accomplished during machine's operating cycle, eliminates idle machine time.

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Meanwhile write for Case Histories and list of satisfied companies in your industry.

*Observation of experienced operators by
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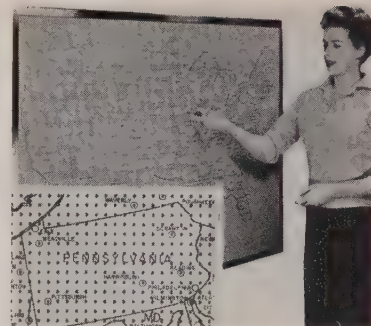


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Systems Specialists in Principal Cities

For More Information Circle Reader Service Card No. 177

U. S. Map



A large outline map of the United States, imprinted on a 36 x 48-in. perforated 16-gauge steel panel, shows more than 300 key cities. The Working-Map, introduced by Power Dispatchers Equipment Co., provides a flexible chart for sales territories, market programs, traffic plans and organizational distribution. States and cities are distinctly indicated, but do not interfere with data to be added. Scratch-proof and washable marks may be made on the map using marking inks, tapes, magnets and pressure sensitive materials. Circle No. 119

Tape Reel Accessories



Several accessories for use on magnetic tape reels have been introduced by Pro-Tex Reel Band Co. The first (shown above) is a non-magnetic tape reel clip that snaps over the reel flange to keep tape from loosening and unwinding. Sizes to fit all reels, for all widths of tape are available. Pro-Tex also announces a friction-free reel that winds tape smooth and tight. An embossed design on the inner surface of both reel flanges is said to reduce reel-to-tape friction by 98 percent. Final new product from Pro-Tex is a packaged tape reel called Sealreel. Circle No. 113

STANDARD REGISTER ANNOUNCES THE NEW

STANOMATIC

SOURCE DATA HANDLING SYSTEM

A breakthrough development in the important data acquisition area ahead of the computer—a development that obsoletes the pencil for the creation of all production control and labor distribution source records—a development that permits complete automatic handling of data from factory floor to computer.

■ An entirely new concept of source record creation and handling is introduced by Standard Register, pioneer in paperwork simplification.

Now, instead of the usual manual methods of recording data pertaining to labor distribution and production control, it is possible to gather and record this information mechanically for conversion into punched tape, magnetic tape, or tabulating cards for subsequent machine accounting.

Two new data processing machines make this possible:

THE STANRECORDER. This Standard Register machine has been described as the 1961 advanced version of our original autographic register, making use of modern data processing technology—and having implications as important today as the autographic register did when it was first introduced.

This new machine gathers and records, in one place, information concerning labor distribution, output by man, by machine, by department and by job. It automatically lists events in exact chronological sequence. It prints every transaction on a record that is both man-readable and machine-readable.

STANOMATIC READER-TRANSLATOR. Second step in the STANOMATIC SYSTEM is to read the coded forms produced by the Stanrecorder and translate the data into the language of machine accounting. This is the function of the Reader-Translator.

In companies with relatively small production volume, this job can be accomplished by manual key-punching of tabulating cards using the form prepared in the Stanrecorder as the source document. But where volume is high the Reader-Translator provides the

final step in total automation of data handling.

COMPREHENSIVE REPORTS. With the STANOMATIC SYSTEM, management gets faster, more accurate, more comprehensive reports. Among the end results is complete control of payrolls, hiring and layoff, quality control, inventory, material location, production trends, maintenance costs, actual production time, lost time, and other elements of labor distribution and production cost.

FEASIBILITY PACKAGE READY. Get the STANOMATIC story. Here is the automated way to bring the original writing of source data into your machine accounting system.

Ask for details about Standard Register's *Feasibility Package* by which you can test the STANOMATIC SYSTEM at low cost on your own factory floor.

STANDARD REGISTER STANOMATIC SYSTEMS

Business Forms and Forms Handling Equipment for Paperwork Simplification

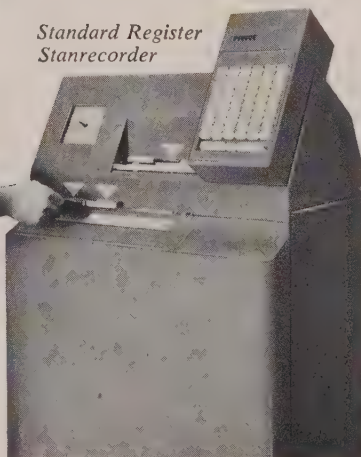


THE STANDARD REGISTER COMPANY, DAYTON 1, OHIO • PACIFIC DIVISION, OAKLAND 6, CALIFORNIA

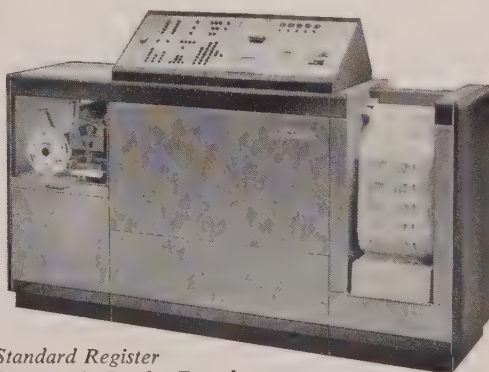
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Standard Register
Stanrecorder

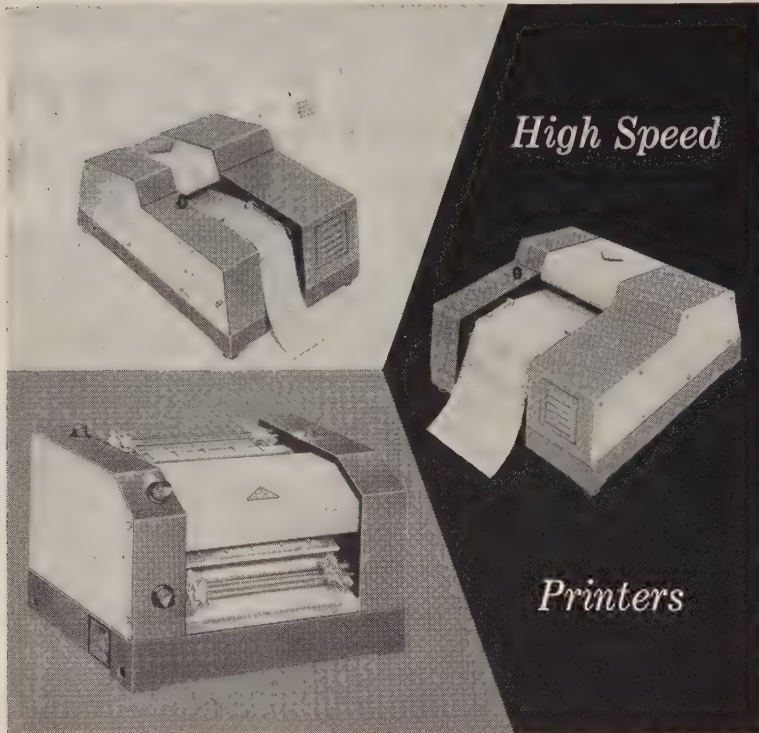


Standard Register
Stanomatic Reader-Translator



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The highly specialized skills acquired by Anelex engineers in the creative development of advanced systems enables them to best design mechanical, electro-mechanical and electronic out-put equipment. In all probability the techniques required for your particular system have already been accomplished. This group, with their extensive knowledge and experience, is available for a discussion of your requirements.

*Anelex High Speed Printers are supplied as standard equipment by 22 major computer and systems builders.



*Anelex printers will be displayed in Booth 93-94
Western Joint Computer Conference.*

ANELEX CORPORATION

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Copies On Request

Routine Correspondence—“Auto-Typist Hits Letter Typing Right on the Button” is the title of a booklet from American Automatic Typewriter Co. showing a fast, economical way to handle correspondence. Circle No. 131

Microwave System—A 12-page bulletin explains the Lynch Communications Systems, Inc., LMR20 6 kmc Microwave System. It features a low cost, “flexible” transmission medium for telephone, telegraph, teleprinter, protective relaying and telemetering. Circle No. 132

Automatic Announcing System—Westrex Corp., division of Litton Industries, describes its automatic announcing system completely, including schematics and photos in a six-page bulletin. Circle No. 133

Numerical Control—“Numerical control as applied to the complete integration of product testing with a manufacturing business,” is the subject of a paper by W. S. Bennett, senior designer with Designers for Industry, Inc. Circle No. 134

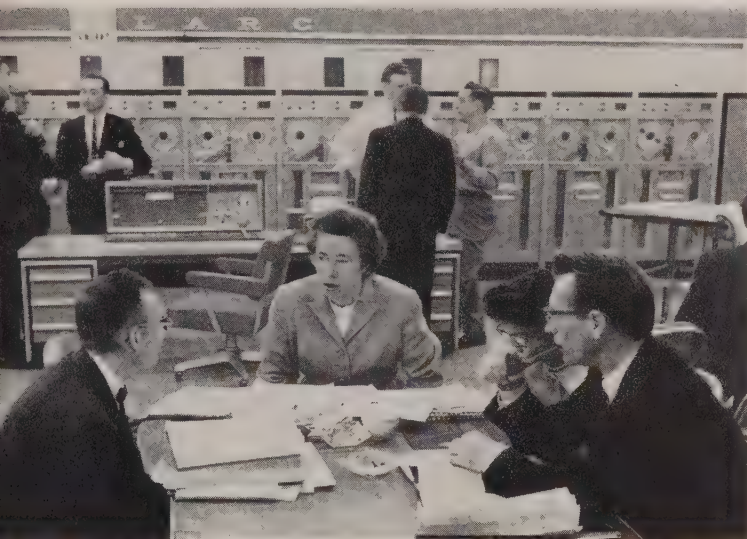
Collect Accounts—A publication offering suggestions of ways to “Collect More Past-Due Accounts” has been written by the staff of the United States Collection Assn., Inc., and is offered by that company. Circle No. 135

Conversion Equipment—Inter-computer magnetic tape conversion equipment is described in a bulletin from Auerbach Electronics Corp., developers of the new equipment. Circle No. 136

M S & A Consultants—Marc Shio-witz and Associates, Inc., computer consultants and engineers, has available an eight-page brochure on its services in systems engineering, logic design, circuit design and computer programming. Circle No. 137

NEWS

LARC II Completes Navy Acceptance Test



Members of the Applied Mathematics Laboratory at David Taylor Model Basin, Washington, D. C., discuss progress of Univac LARC II in tests.

Acceptance test on a Remington Rand Univac LARC II computer has been completed successfully at the U. S. Navy's David Taylor Model Basin in Washington, D. C.

Under the supervision of Capt. J. A. Obermeyer, commanding officer and director, and Dr. Harry Polachek, technical director of the Applied Mathematics Laboratory at the Model Basin, the Univac LARC will be used to construct three-dimensional mathematical models of nuclear reactors to enable the design engineer to study and compare varying designs in a highly compressed period of time. This simulation technique will eliminate the costly necessity of building many pilot models for the tests.

In addition, the Univac LARC will be used to calculate solutions to problems in the fields of engineering, research, management data analysis and operations research, including development of a digital method for spectrum analysis of ocean wave patterns, calculations related to the design of large arrays of transducers, and the analysis of magnetic fields for minesweeping operations.

This marks nine years that math-

ematicians at the Applied Mathematics Laboratory have utilized high speed electronic computers to solve naval engineering projects (including Nautilus and Sea Wolf atomic submarines).

Investors Get Private Wire

Chicago investment firm, Crutenden, Podesta & Co., has installed a specially developed automatic private wire system providing fast point-to-point transmission of data and other communications with its branch offices from coast to coast.

The system, Plan 115-A, has been engineered by Western Union. It enables as many as 20 stations to send and receive messages on a single circuit in an automatic sequence which can be varied. Robert A. Podesta, managing partner of the firm, said: "Plan 115-A is particularly suited to our highly specialized and constantly expanding wire requirements. At the outset, our firm will use it primarily for instantaneous transmission of buy and sell orders for listed and unlisted securities, accounting data and other inter-branch messages."

Controllers Elect Directors

The Controllers Institute of America, meeting on April 7 for their Eastern Area Conference in Washington, chose 14 members from United States and Canada for its national board of directors.

They include Edward M. Blanchard, treasurer, Arcos Corp., Philadelphia; Charles J. J. Cox, controller and assistant treasurer, Western Air Lines, Inc., Los Angeles; Fred J. Donaghy, vice president and treasurer, Duriron Co., Inc., Dayton; James J. Doyle, director of finance, The Port of New York Authority, New York; Kenneth W. Hill, controller, Meredith Publishing Co., Des Moines; W. B. Morrow, assistant secretary-treasurer, Hyster Co., Portland, Ore.; Lawrence H. Pexton, treasurer, General Radio Co., West Concord, Mass.; William R. Phelan, vice president-treasurer, United States Fidelity & Guaranty Co., Baltimore.

Joseph J. Schofield, vice president and controller, Dura Corp., Oak Park, Mich.; Walter A. Smith, executive vice president, Formica Corp., Cincinnati; J. Robert Spangler, secretary-treasurer, The Mountain States Telephone & Telegraph Co., Denver; J. A. Ross, vice president and treasurer, Shell Oil Co. of Canada, Ltd., Toronto; Carl J. Thomsen, vice president-control and finance, Texas Instruments Inc., Dallas; and George Williamson, vice president and secretary-treasurer, H. W. Lay & Co., Chamblee, Ga.

WJCC Meets in Los Angeles

When the Western Joint Computer Conference meets in Los Angeles May 9-11, the 2,500 participants expected to attend will be greeted with the challenge: "Computer accomplishments will be of ultimately greater significance to civilization than those of space technology or nuclear physics."

The conference is sponsored by

Continued on Page 61

$$m = 9.1 Q_n$$

$$\mu_c = \mu_g$$

$$V = \frac{2}{3}x + 2$$

$$A = P(1+r)^n$$

$$\frac{L_{in}(min)}{L(max)}$$

$$D = kV^2$$



***The LGP-30
Electronic Computer
is designed to stop
the juggling of figures
—and start the
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The Royal Precision LGP-30 can solve routine and theoretical mathematical problems 30 times faster than any man—yet rents for little more than the salary of an additional engineer.

It is simple to program and operate, so no special programmer is needed.

An engineer can use it himself.

It requires no air-conditioning or costly installation. It plugs into any 110-volt AC wall outlet. It is mobile, so it rolls anywhere.

It is desk-size, so it requires little room.

This means that the Royal Precision LGP-30 is ready to go to work to help your company create new products—and fresh profits—the very same day it is delivered. Can you wonder that there are more LGP-30's installed and working right this minute than any other electronic computing system in its class?

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Floyd Ritchie, Royal McBee Corporation,
Port Chester, New York.



ELECTRONIC DATA PROCESSING SYSTEMS

News

Continued from Page 59

the National Joint Computer Committee, representing the Institute of Radio Engineers, the American Institute of Electrical Engineers and the Assn. for Computing Machinery. In discussing the theme "Extending Man's Intellect," the chairman of the conference, Dr. Walter F. Bauer, Thompson Ramo Wooldridge, Inc., stated: "Indeed, it can be said that man's ultimate goal is not to explore the universe nor to harness unlimited energy, but to build a device equal to or nearly equal to his own mental powers."

Approximately 70 technical papers by 87 authors will be discussed in 15 sessions, including "Modeling Human Mental Processes" and "Information Retrieval."

Keynoter of the event will be Thomas Watson, Jr., president of International Business Machines.

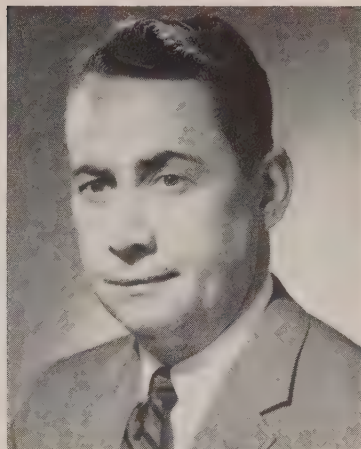
Editor Named



W. C. Rockwell

W. C. Rockwell has been named managing editor of Office Automation publications, succeeding R. Hunt Brown. He was formerly trade press manager for Univac Div. of Remington Rand Div., Sperry Rand Corp.

Promoted to IBM Post

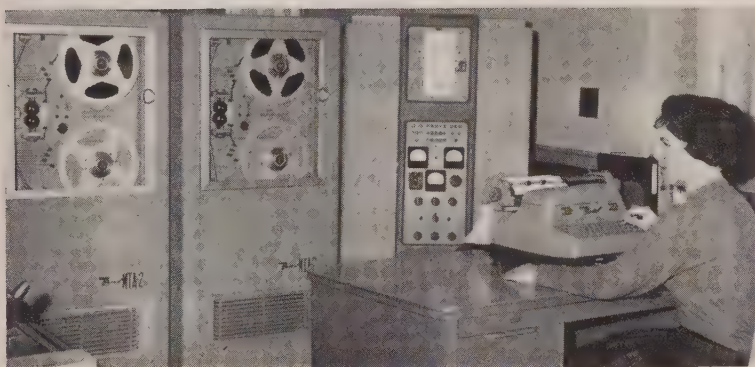


Frank H. McCracken

Promoted to the position of midwestern regional manager of the Data Processing Div. of International Business Machines Corp. is Frank H. McCracken. He will supervise all marketing and service operations of IBM's data processing division in an area including six districts and 68 branch offices, covering 16 states.

The announcement was made by Gilbert E. Jones, division president, in conjunction with the appointment of Warren Hume, McCracken's predecessor in the midwestern post, to vice president of the division in Endicott, N. Y.

Bank Establishes Commercial EDP Service



The Waterbury National Bank of Conn.'s Bendix computer and magnetic tape accessories are shown at the bank's new division for EDP.

A data processing project thought to be unique in the banking business has been established by The Waterbury (Conn.) National Bank. Engaging to lease equipment from the Computer Div. of the Bendix Corp., Harlan H. Griswold, bank president, announced the development of a service bureau as a division of the bank. The Automated Accounting Center of Conn. will "furnish data processing services to companies which, like this bank, could not afford to set up an installation exclusively for their own use," said Griswold.

The center's service will be sold on a time and fee basis to any busi-

ness in the state and pre-selected areas in bordering states. Griswold emphasized: "These services will not be furnished free in exchange for deposit accounts or increases in deposit balances." The service is designed to be profitable to the bank.

When all the components of the system are fully integrated, two-thirds of the center's time will be used to process large quantities of business and industrial data. The remaining time will be utilized by the bank for its accounting work. Already, local engineering and accounting firms have arranged to use the system.

EDP to Control Messages

International communications traffic is expected to be handled by an electronic data processing system developed by Radio Corp. of America. This fact was announced by Thompson H. Mitchell, president of RCA Communications, Inc., who says the system will be ready in 1962.

Employing electronic data processing techniques in international commercial communications for the first time, the system is intended to solve the critical problem growing out of the steadily increasing radio and cable traffic—press, government and business—resulting from the intensifying tempo of world events, Mitchell said.

An RCA 601, stationed at 60 Broad Street in New York, will be fed information that will enable it to handle automatically and rapidly all messages from any channel of communication, including satellite transmission.

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SPEED for faster service . . . SPEED for more output per dollar invested . . .
SPEED to maintain work flow of entire record handling and data processing operations.

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because:

- records *ROLL* to the seated clerk
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Business Calendar

May 7-11 — Forty-Second International Conference and Office Exposition of the National Office Management Assn., Kiel Auditorium, St. Louis. Write: Field Service Div., NOMA, Willow Grove, Pa.

May 9-11 — Western Joint Computer Conference, sponsored by the IRE, AIEE and ACM. Ninth Annual Meeting theme: "Extending Man's Intellect." Ambassador Hotel, Los Angeles, Calif. For more information write: Dr. W. F. Bauer, Ramo-Wooldridge Co., 8433 Fallbrook Ave., Canoga Park, Calif.

May 18-20 — Federal Government Accountants Assn., Tenth Annual National Symposium at the Hotel Shoreham, Washington, D. C. Public exhibition. Write: FGAAC, 1523 L St., N.W., Washington 5, D. C.

May 25-26 — Nineteenth National Meeting of the Operations Research Society of America, Sheraton-Blackstone Hotel, Chicago. Meeting Chairman: Donald H. Schiller, Caywood-Schiller Assoc., 203 N. Wabash Ave., Chicago 1.

June 6-8 — Instrument Society of America Summer Instrument-Automation Conference and Exhibit, Royal York Hotel (c) and Queen Elizabeth Hall (e), Toronto, Ont., Canada. Contact: Wm. H. Kushnick, Executive Dir., ISA, 313 Sixth Ave., Pittsburgh 22, Pa.

June 13-16 — Cornell University Seminars in Industrial Engineering, sponsored by the Dept. of Industrial Engineering Administration of the Sibley School of Mechanical Engineering, Cornell University, Ithaca, N. Y. Specialists from industry and university staff conduct nine seminars, including "Systems Simulation Using Digital Computers." Additional Information: J. W. Gavett, Seminars Coordinator, Upson Hall, Cornell Univ., Ithaca, N. Y.

June 28-30 — Tenth Anniversary Conference, National Machine Accountants Assn., Royal York Hotel, Toronto, Ont., Canada. More information: NMAA International Headquarters, 1750 West Central Rd., Mount Prospect, Ill.

Book Reviews

Production Forecasting Planning and Control

By E. H. MacNiece. Published by John Wiley & Sons, Inc., 440 Park Ave. S., New York City 16. \$9.75.

Although MacNiece has prepared this book as a text on production engineering techniques, there is certainly much in it for the layman. An introduction and rather extensive (and technical) explanation of the methods of integrating production on an industry basis further propounds the advantages and techniques of scientific management. An interesting chapter on automation includes a section on operations research.

The very tightly constructed format takes the reader from the manufacturing planning stages to such areas as sales forecasting, control, loading problems, evaluation, organization, and integration with accounting and quality control. It ends with an illustrative and enlightening example of a practical problem, utilizing all the steps covered. Challenging.

ABC's of Computers

By Allan Lytel. Published by Howard W. Sams & Co., Inc., Technical Book Div., 2201 East 46th St., Indianapolis 6, Ind. \$1.95.

This paperback handbook has been written to serve as a basic,

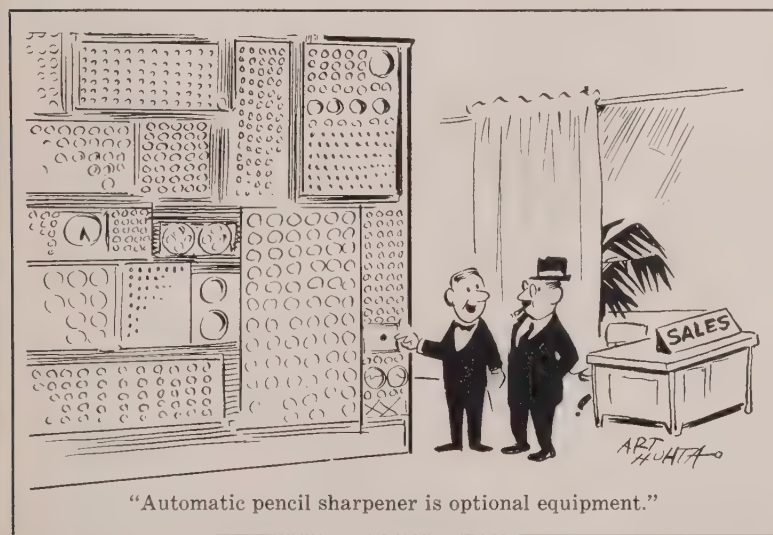
self-teaching introduction to electronic computers. It explains in relatively easy-to-understand language what computers are, how they operate and what they can be expected to do.

Its scope of interest could be from student laymen to electronic technician. Based on the author's teaching experiences at Temple Univ. Technical Institute & Community College and at International Business Machines, "ABC's of Computers" describes both digital and analog computers. In logical progression, it discusses circuits, tube and relay switching devices, and solid state circuit devices such as transistors, diodes, photo-electric components and magnetics.

The book also explains the numbers for computers, such as binary notation, arithmetic operation, octal numbering, numbering codes, symbolic logic and basic logical circuits. Counters (binary, decade and ring types) are discussed, followed by calculating circuits, numbering representation, comparison circuits. A chapter is devoted to input-output devices.

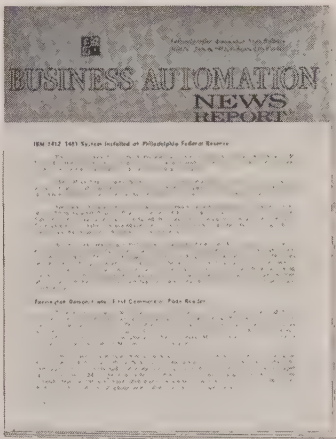
The final chapter discusses programming and computer instructions. The book is fine for a fairly understandable and thorough X-ray view of the insides of computers and what makes them tick.

Continued on Page 64



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Book Reviews

Continued from Page 63

Physical Distribution Management

By E. W. Smykay, D. J. Bowersox, F. H. Mossman. Published by The Macmillan Co., 60 Fifth Ave., New York City 11. \$8.00.

Quantitative analyses of the logistics problem of a firm's physical distribution are thoroughly and concretely discussed by the authors of this book.

Suggested steps a firm may take to be sure the right quantities are in the right market at the right time are generously offered. Particularly emphasized is the fact that best spatial arrangement of plant capacity and warehouse facilities to minimize movement costs, while permitting a company to serve its share of the market, can be calculated precisely by means of computers.

Check lists to aid the marketing or traffic manager in selecting the most efficient, economical mode of

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Case studies well illustrate many of the theories discussed. A detailed study is made of the techniques of determining whether a warehouse is economically justified. Methods of total cost analysis, location analysis, sales forecasting and inven-

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next month . . .

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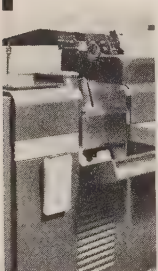
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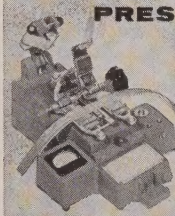
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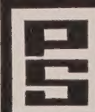
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EDITORIAL

What Day Has Done

The new postmaster general, J. Edward Day, has lost little time in proclaiming his membership in the anti-automation society that is flourishing so well these days in the nation's capital. One of his first official acts was to cancel the experimental "speed mail" project which involved the facsimile transmission of first class mail over microwave networks. Some \$4½ million had been spent to develop the speed mail system under former postmaster general, Arthur Summerfield, who envisioned a general use of the system within two or three years.

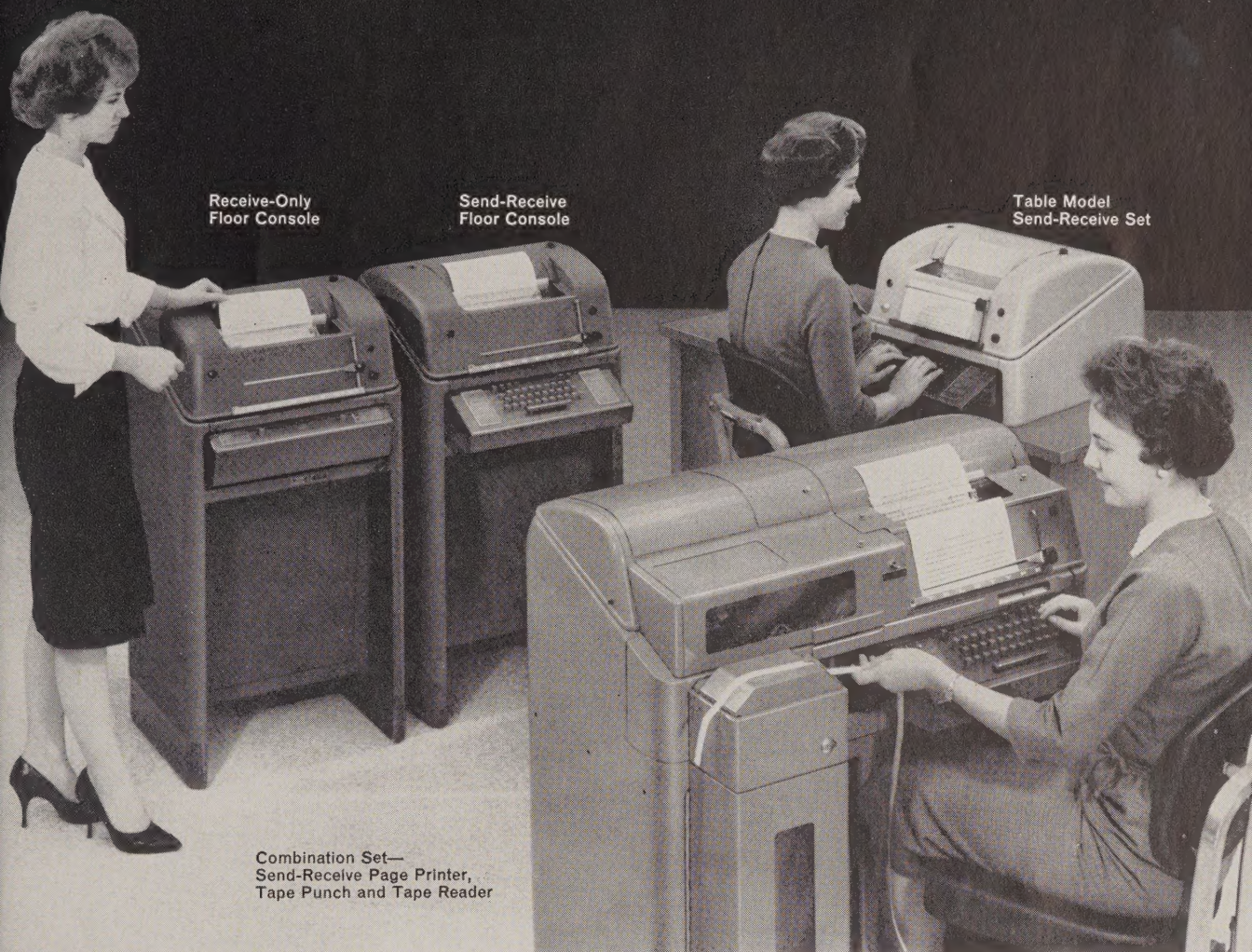
Day also gave indications of swinging the New Frontier axe at "Project Turnkey" (see April, page 36) the country's first automated post office, now operating at Providence, R. I. Turnkey, another Summerfield project, cost \$16 million and was designed as a working postal laboratory, with sufficient automatic facilities to serve over 100 post offices in the area.

The decision to halt these automation projects was undoubtedly hastened by the House appropriations committee which recently approved a \$4,368,500,000 budget for the post office department. With the budget approval went a warning to Day that his department had better forget about automation and "concern itself with more practical matters."

Premature cancellation of the various automation programs is anything but practical. Both speed mail and Turnkey represent a substantial investment in progress. The facsimile service was in the first testing stages but gave ample indications of future success. Project Turnkey has had only a few months of actual operation, hardly enough time to prove its effectiveness.

Both of these projects were pioneer efforts; the first step toward a more economical and efficient postal system. Opposition to them comes mainly from politicians fearing a loss of patronage, and from leaders of postal worker unions, concerned with their pocketbooks. In bowing to these pressure groups, Day appears to show more concern for vote delivery than he does for mail delivery.

With the postal department's annual deficit at the \$900 million mark and with the entire postal system facing eventual collapse under existing antiquated methods of mail handling, we suggest that Day put political prejudices aside and carry on with his predecessor's automation program.



Receive-Only
Floor Console

Send-Receive
Floor Console

Table Model
Send-Receive Set

Combination Set—
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Tape Punch and Tape Reader

Which Teletype printer is best for you?

Which of these Teletype Model 28 page printers is best for your message and data communications needs? Each will perform the basic function of all Teletype equipment—to flash information over long or short distances. But in addition, each has varying capabilities to meet the requirements of the individual user:

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Receive-only page printer in console—the same machine, but without a keyboard. For use where information need only be received, not sent. No operator is required.

Table model—with or without keyboard . . . similar model available for rack mounting.

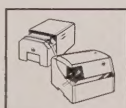
Combination set—a complete message center in one

compact cabinet. In addition to page printer and keyboard, it contains facilities for preparing punched tape and for transmitting and receiving via tape.

All of these Teletype Model 28 page printers feature the Stunt Box, a built-in "programming" mechanism that will inexpensively handle a wide variety of remote control and switching tasks such as automatic station selection. All models can be supplied with sprocket-feed and tabulating mechanisms for use with multi-copy business forms. All are available, too, in a choice of colors to match office decor.

Teletype Corporation manufactures this equipment for the Bell System and others who require the utmost reliability from their data communications. Teletype equipment can be used with Data-Phone and other communications services.

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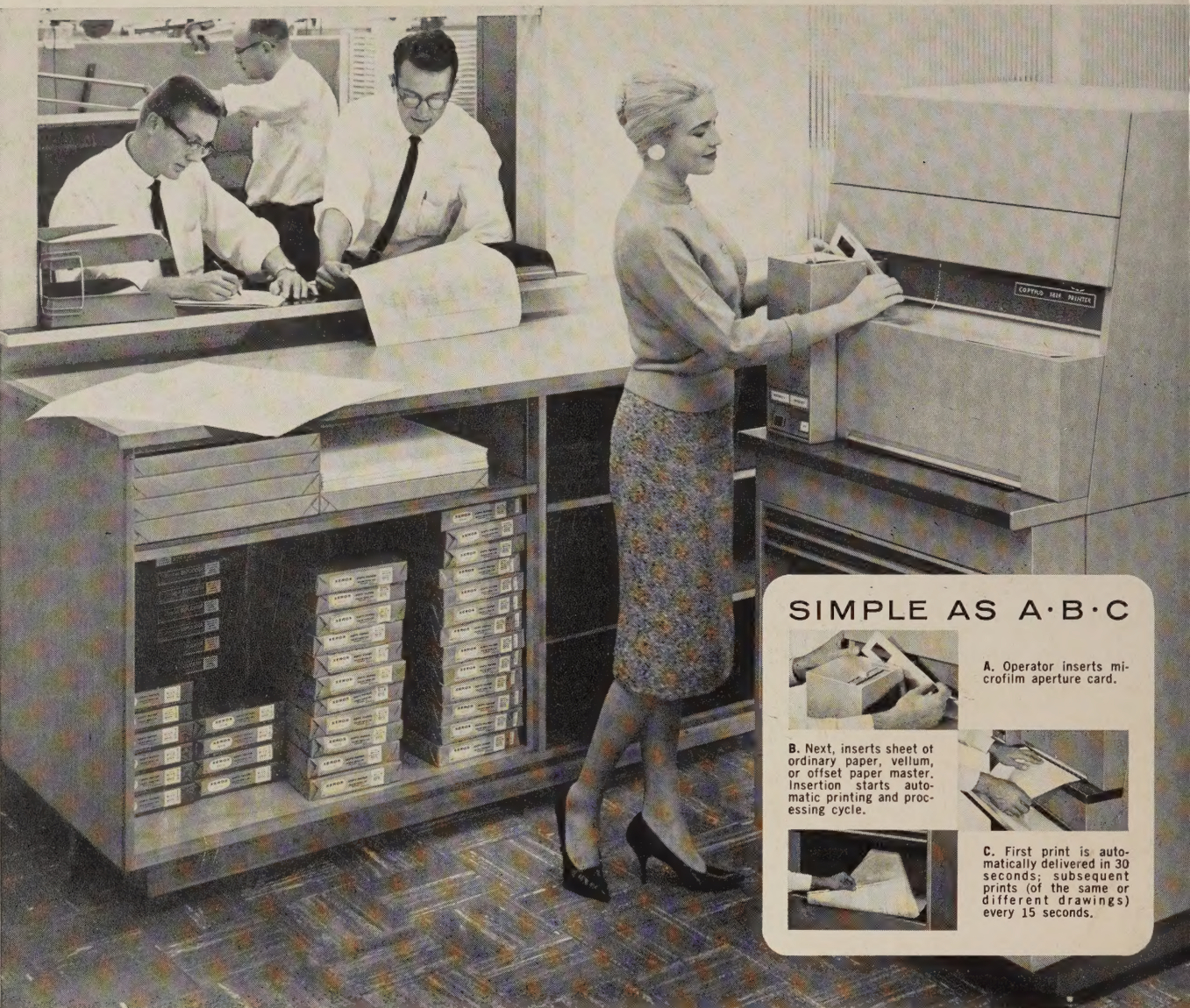


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